ORDER NO. KMS0306778C2

Service Manual

Digital Proprietary Telephone

KX-T7665NE / KX-T7665NE-B

White version
Black version
(for Europe)

© 2003 Panasonic Communications Co., Ltd. All rights reserved.
Unauthorized copying and distribution is a violation of law.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all of the 11 digits. The serial number may be found on the unit.

Panasonic

IMPORTANT INFORMATION ABOUT LEAD FREE, (PbF), SOLDERING

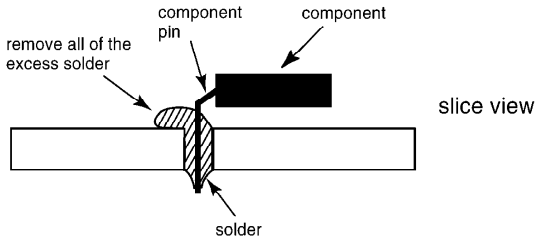
If lead free solder was used in the manufacture of this product the printed circuit boards will be marked PbF.
Standard leaded, (Pb), solder can be used as usual on boards without the PbF mark.
When this mark does appear please read and follow the special instructions described in this manual on the use of PbF and how it might be permissible to use Pb solder during service and repair work.

1. ABOUT LEAD FREE SOLDER (PbF: Pb free)

Note:
In the information below, Pb, the symbol for lead in the periodic table of elements, will refer to standard solder or solder that contains lead.
We will use PbF solder when discussing the lead free solder used in our manufacturing process which is made from Tin, (Sn), Silver, (Ag), and Copper, (Cu).
This model, and others like it, manufactured using lead free solder will have PbF stamped on the PCB. For service and repair work we suggest using the same type of solder although, with some precautions, standard Pb solder can also be used.

Caution

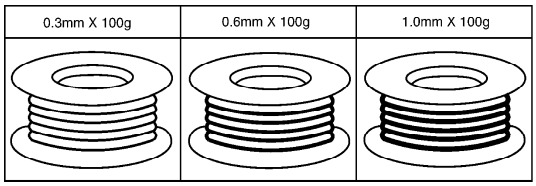
- **PbF solder has a melting point that is 50° ~ 70° F, (30° ~ 40°C) higher than Pb solder. Please use a soldering iron with temperature control and adjust it to 700° ± 20° F, (370° ± 10°C). In case of using high temperature soldering iron, please be careful not to heat too long.**
- **PbF solder will tend to splash if it is heated much higher than its melting point, approximately 1100°F, (600°C).**
- **If you must use Pb solder on a PCB manufactured using PbF solder, remove as much of the original PbF solder as possible and be sure that any remaining is melted prior to applying the Pb solder.**
- **When applying PbF solder to double layered boards, please check the component side for excess which may flow onto the opposite side (See figure, below).**



1.1. SUGGESTED PbF SOLDER

There are several types of PbF solder available commercially. While this product is manufactured using Tin, Silver, and Copper, (Sn+Ag+Cu), you can also use Tin and Copper, (Sn+Cu), or Tin, Zinc, and Bismuth, (Sn+Zn+Bi).
Please check the manufacturer's specific instructions for the melting points of their products and any precautions for using their product with other materials.

The following lead free (PbF) solder wire gauges are recommended for service of this product: 0.3mm, 0.6mm and 1.0mm.



1.2. HOW TO RECOGNIZE THAT Pb FREE SOLDER IS USED

PbF is stamped to show that Pb free solder is used. (See the figure below.)

2. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.
When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover the plastic parts boxes with aluminum foil.

2. Ground the soldering irons.

3. Use a conductive mat on the worktable.

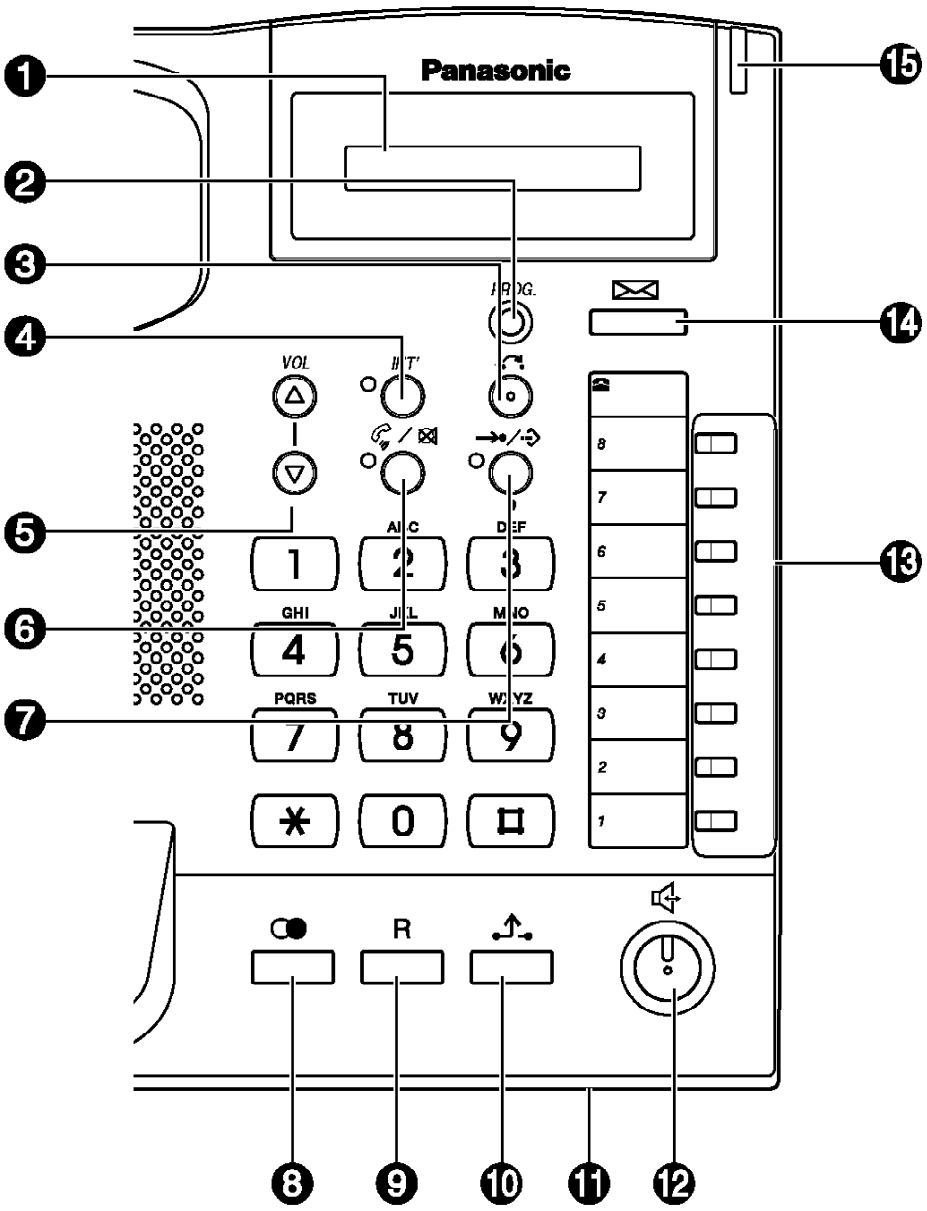
4. Do not touch IC or LSI pins with bare fingers.

3. SPECIFICATIONS

Station Loop Limit:	**90 ohms**	
Calling Method:	**2 pair wire**	
Jacks:	**Handset Jack, TEL Jack**	
Dimensions:	**Low Angle:**	**213 (D)mm × 177 (W)mm × 107 (H)mm**
	High Angle:	**201 (D)mm × 177 (W)mm × 127 (H)mm**
Weight:	**0.7 kg**	

Design and specifications are subject to change without notice.

4. LOCATION OF CONTROLS


Panasonic
VOL
R
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

❶ **LCD (Liquid Crystal Display)**

❷ **PROGRAM:**
Used to enter and exit the personal programming mode.

❸ **TRANSFER:**
Used to transfer a call to another party.

❹ **INTERCOM:**
Used to make or receive intercom calls.

❺ **VOLUME Control Button:**
Used to adjust the volume.

❻ **AUTO ANS (Auto Answer)/MUTE:**
Used to receive an incoming call in hands-free mode or mute the microphone/handset during a conversation.

❼ **AUTO DIAL/STORE:**
Used for System/Personal Speed Dialling or storing programme changes.

❽ **REDIAL:**
Used to redial the last dialled number.

❾ **FLASH/RECALL:**
Used to disconnect the current call and make another call without hanging up.

❿ **HOLD:**
Used to place a call on hold.

⓫ **Microphone:**
Used for the hands-free conversation.

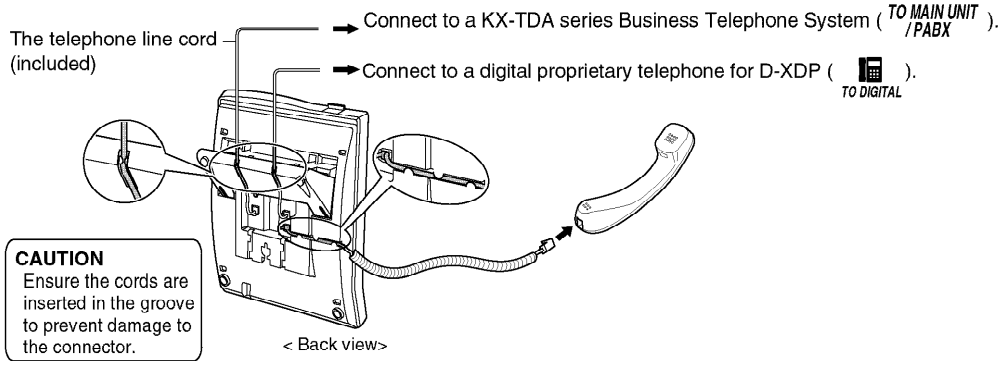
⓬ **SP-PHONE (Speakerphone):**
Used for the hands-free operation.

⓭ **Flexible Outside (CO) Line Buttons:**
Used to make or receive an outside call. Pressing this button seizes an idle outside line automatically. (Button assignment is required.)
Also used as feature buttons. (Button assignment is required.)

⓮ **MESSAGE:**
Used to leave a message waiting indication or call back the party who left the message waiting indication.

⓯ **Message/Ringer Lamp:**
When you receive a call, the lamp flashes red. When someone has left you a message, the lamp stays on red.

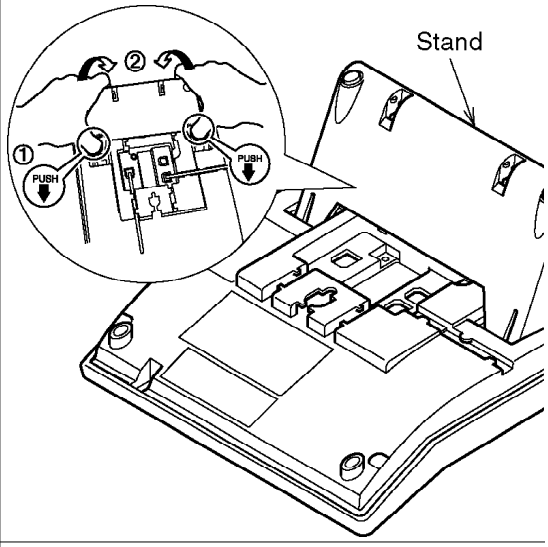
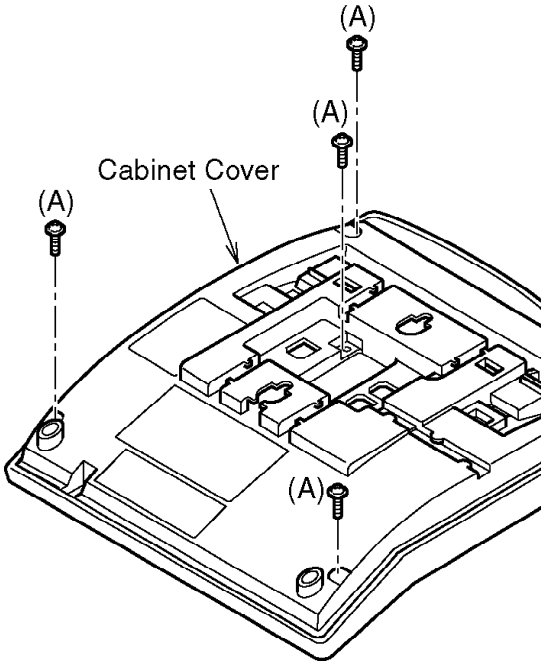
5. CONNECTION


The telephone line cord (included)
Connect to a KX-TDA series Business Telephone System (TO MAIN UNIT / PABX).
Connect to a digital proprietary telephone for D-XDP (TO DIGITAL).
CAUTION
Ensure the cords are inserted in the groove to prevent damage to the connector.
< Back view>

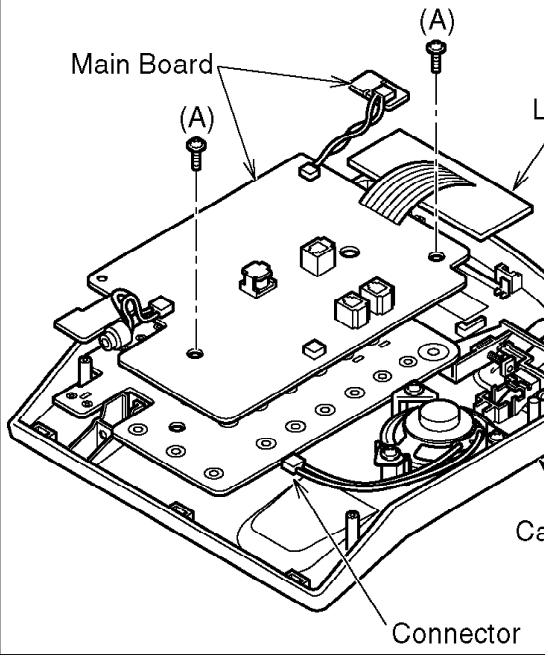
Caution:

The availability of D-XDP function depends on the software version of the connected Business Telephone System.
Consult your dealer for more details about D-XDP.

6. DISASSEMBLY INSTRUCTIONS

1. Remove the Stand.	
2. Remove 5 Screws (A). **3. Remove the Cabinet Cover.**	

4. Remove the Connector from the Main Board.
5. Remove 2 Screws (A).
6. Remove the Main Board and the LCD from the Cabinet Body.



7. HOW TO REPLACE A FLAT PACKAGE IC

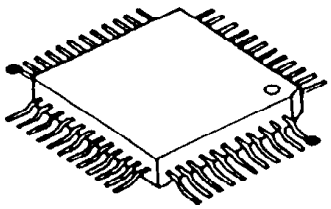
7.1. PREPARATION

- PbF (: Pb free) Solder
- Soldering Iron
  Tip Temperature of 700°F ± 20°F (370°C ± 10°C)
  Note: We recommend a 30 to 40 Watt soldering iron. An expert may be able to use a 60 to 80 Watt iron where someone with less experience could overheat and damage the PCB foil.
- Flux
  Recommended Flux: Specific Gravity →0.82.
  Type →RMA (lower residue, non-cleaning type)

Note: See ABOUT LEAD FREE SOLDER (PbF: Pb free) ().

7.2. PROCEDURE

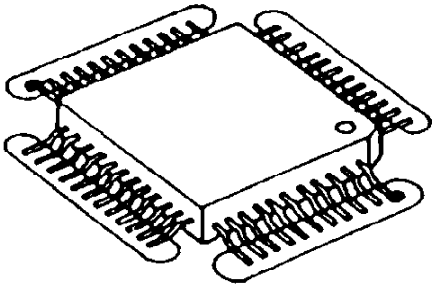
1. Tack the flat pack IC to the PCB by temporarily soldering two diagonally opposite pins in the correct positions on the PCB.



● – – – – – –Temporary soldering point.

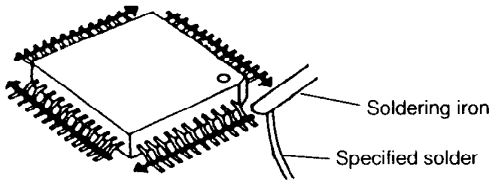
Be certain each pin is located over the correct pad on the PCB.

2. Apply flux to all of the pins on the IC.



– – – – – – Flux

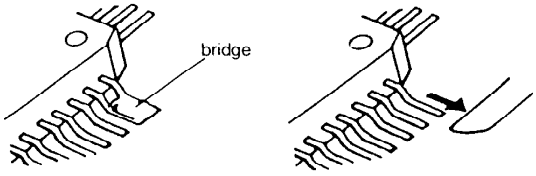
3. Being careful to not unsolder the tack points, slide the soldering iron along the tips of the pins while feeding enough solder to the tip so that it flows under the pins as they are heated.



7.3. REMOVING SOLDER FROM BETWEEN PINS

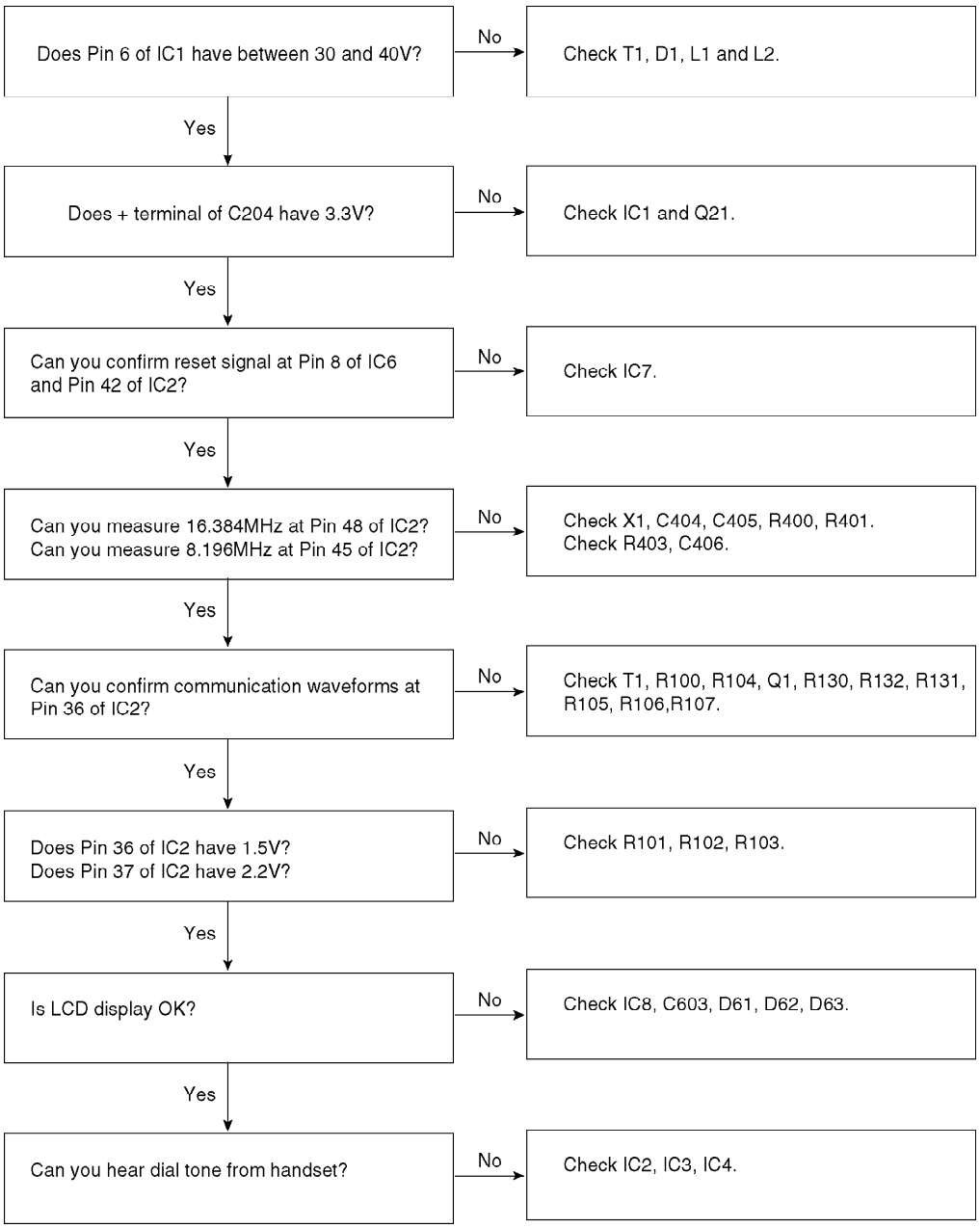
1. Add a small amount of solder to the bridged pins.

2. With a hot iron, use a sweeping motion along the flat part of the pin to draw the solder from between the adjacent pads.



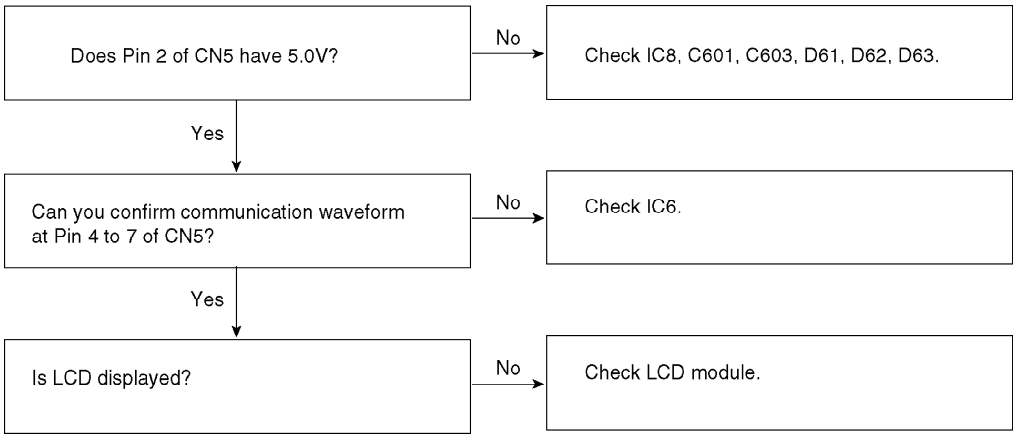
8. TROUBLESHOOTING GUIDE

8.1. NO OPERATION


Does Pin 6 of IC1 have between 30 and 40V?
No
Check T1, D1, L1 and L2.
Yes
Does + terminal of C204 have 3.3V?
No
Check IC1 and Q21.
Yes
Can you confirm reset signal at Pin 8 of IC6 and Pin 42 of IC2?
No
Check IC7.
Yes
Can you measure 16.384MHz at Pin 48 of IC2? Can you measure 8.196MHz at Pin 45 of IC2?
No
Check X1, C404, C405, R400, R401. Check R403, C406.
Yes
Can you confirm communication waveforms at Pin 36 of IC2?
No
Check T1, R100, R104, Q1, R130, R132, R131, R105, R106,R107.
Yes
Does Pin 36 of IC2 have 1.5V? Does Pin 37 of IC2 have 2.2V?
No
Check R101, R102, R103.
Yes
Is LCD display OK?
No
Check IC8, C603, D61, D62, D63.
Yes
Can you hear dial tone from handset?
No
Check IC2, IC3, IC4.

Note:
Refer to (1)~(4) of WAVEFORM () for waveform.

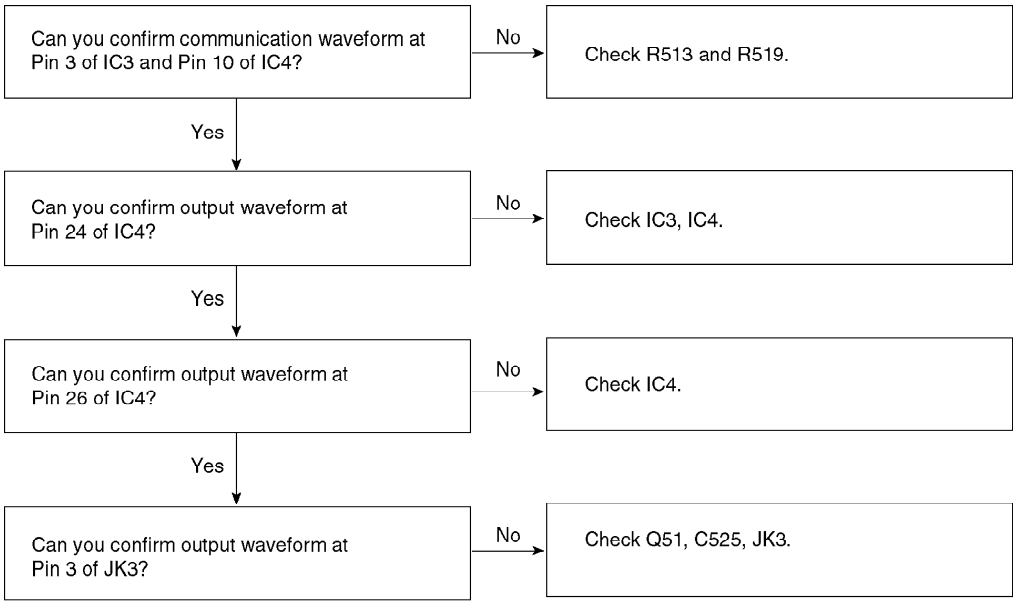
8.2. LCD DOES NOT OPERATE



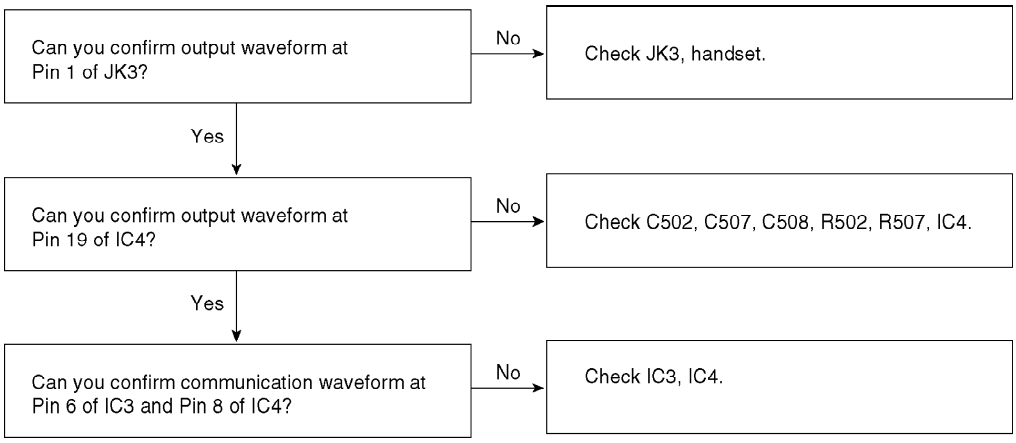
Note:
Refer to (5) of WAVEFORM () for waveform.

8.3. HANDSET DOES NOT WORK

Receive


Can you confirm communication waveform at Pin 3 of IC3 and Pin 10 of IC4?
No
Check R513 and R519.
Yes
Can you confirm output waveform at Pin 24 of IC4?
No
Check IC3, IC4.
Yes
Can you confirm output waveform at Pin 26 of IC4?
No
Check IC4.
Yes
Can you confirm output waveform at Pin 3 of JK3?
No
Check Q51, C525, JK3.

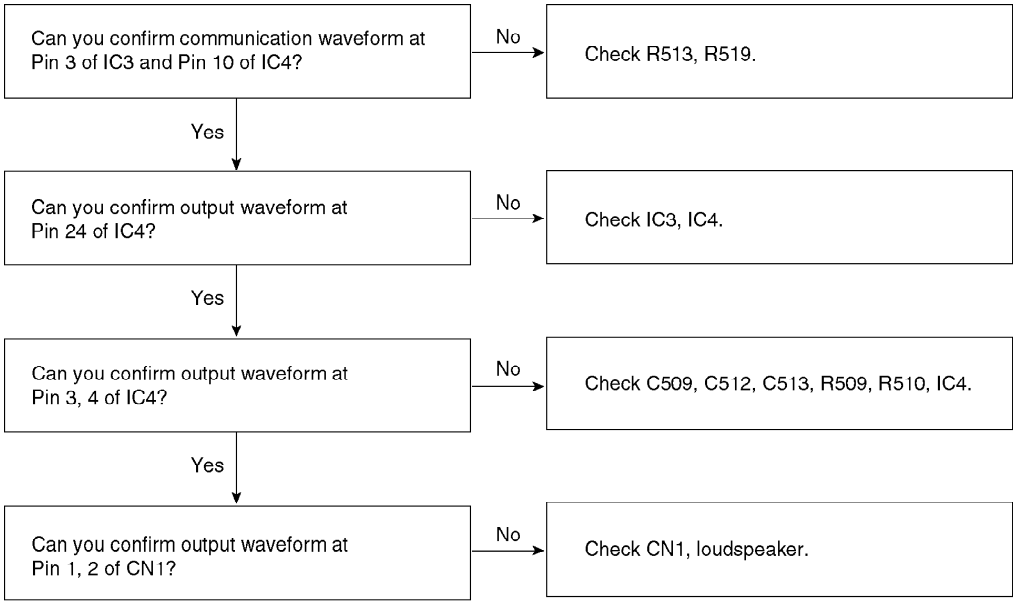
Send


Can you confirm output waveform at Pin 1 of JK3?
No
Check JK3, handset.
Yes
Can you confirm output waveform at Pin 19 of IC4?
No
Check C502, C507, C508, R502, R507, IC4.
Yes
Can you confirm communication waveform at Pin 6 of IC3 and Pin 8 of IC4?
No
Check IC3, IC4.

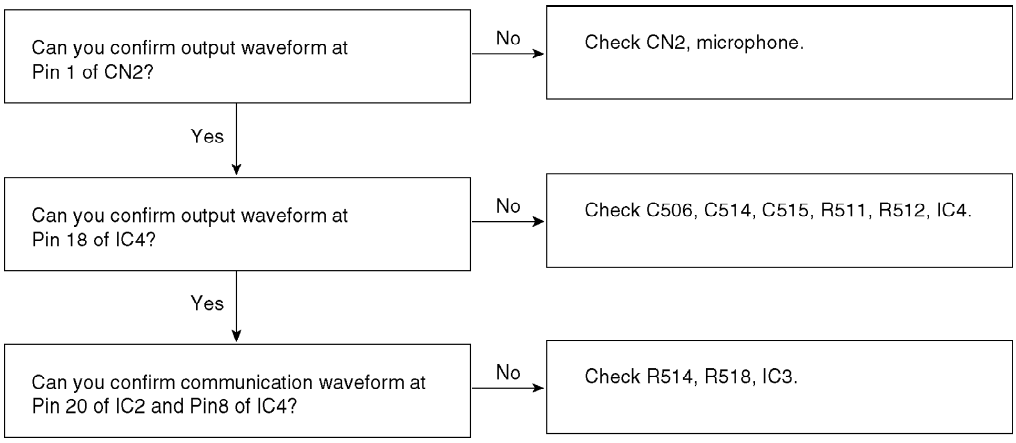
Note:
Refer to (6)~(7) of WAVEFORM () for waveform.

8.4. SPEAKER-PHONE TROUBLE

Receive

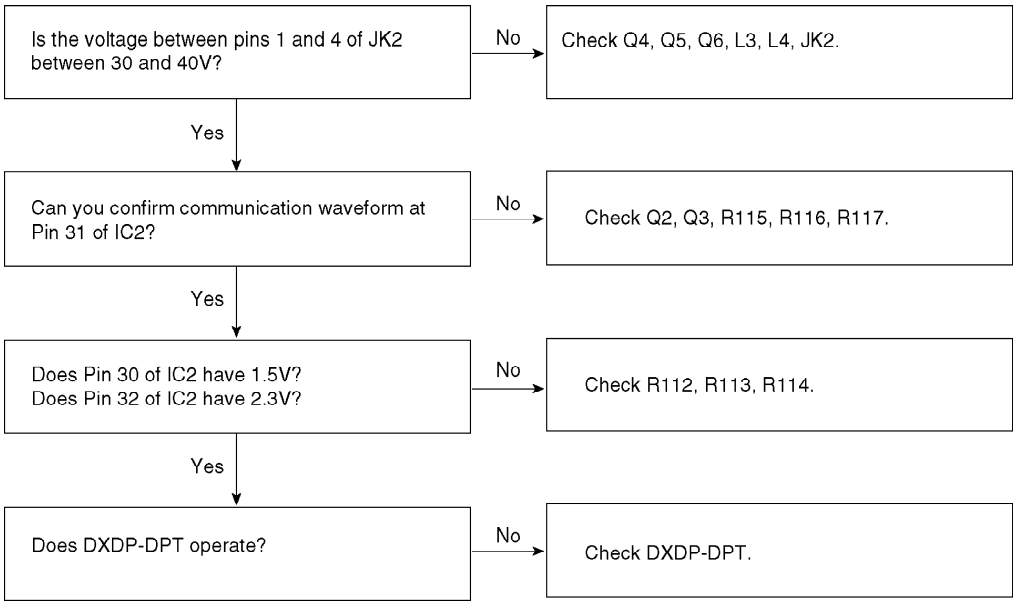

Can you confirm communication waveform at Pin 3 of IC3 and Pin 10 of IC4?
No
Check R513, R519.
Yes
Can you confirm output waveform at Pin 24 of IC4?
No
Check IC3, IC4.
Yes
Can you confirm output waveform at Pin 3, 4 of IC4?
No
Check C509, C512, C513, R509, R510, IC4.
Yes
Can you confirm output waveform at Pin 1, 2 of CN1?
No
Check CN1, loudspeaker.

Send


Can you confirm output waveform at Pin 1 of CN2?
No
Check CN2, microphone.
Yes
Can you confirm output waveform at Pin 18 of IC4?
No
Check C506, C514, C515, R511, R512, IC4.
Yes
Can you confirm communication waveform at Pin 20 of IC2 and Pin8 of IC4?
No
Check R514, R518, IC3.

Note:
Refer to (6)~(7) of WAVEFORM () for waveform.

8.5. DXDP-DPT DOES NOT WORK


Is the voltage between pins 1 and 4 of JK2 between 30 and 40V?
No
Check Q4, Q5, Q6, L3, L4, JK2.
Yes
Can you confirm communication waveform at Pin 31 of IC2?
No
Check Q2, Q3, R115, R116, R117.
Yes
Does Pin 30 of IC2 have 1.5V? Does Pin 32 of IC2 have 2.3V?
No
Check R112, R113, R114.
Yes
Does DXDP-DPT operate?
No
Check DXDP-DPT.

Note:
Refer to (8) of WAVEFORM () for waveform.

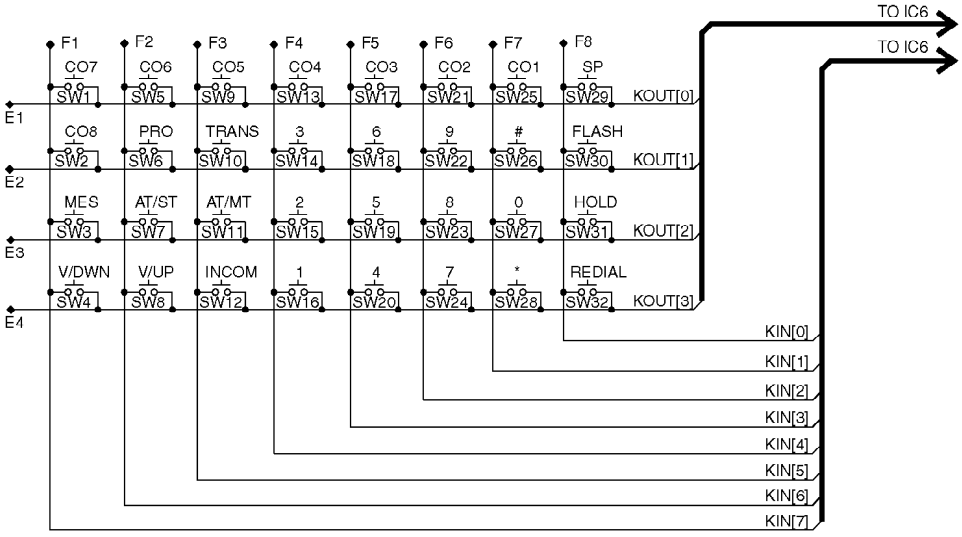
9. BLOCK DIAGRAM

10. CIRCUIT OPERATIONS

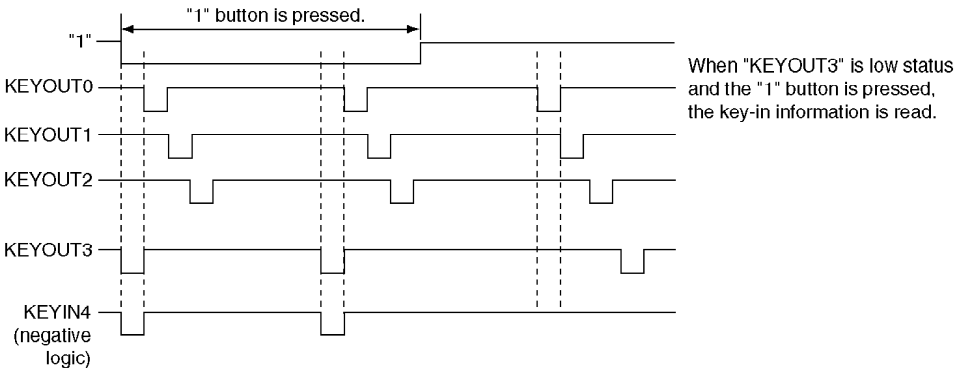
10.1. KEY INPUT CONTROL CIRCUIT

The key data is under the matrix control by 20 to 23(KEYOUT) and 28 to 35(KEYIN) of IC6.
The key information outputted from KEYOUT is inputted into KEYIN, when the key is pressed.

CIRCUIT DIAGRAM



KEY INPUT CONTROL TIMING CHART



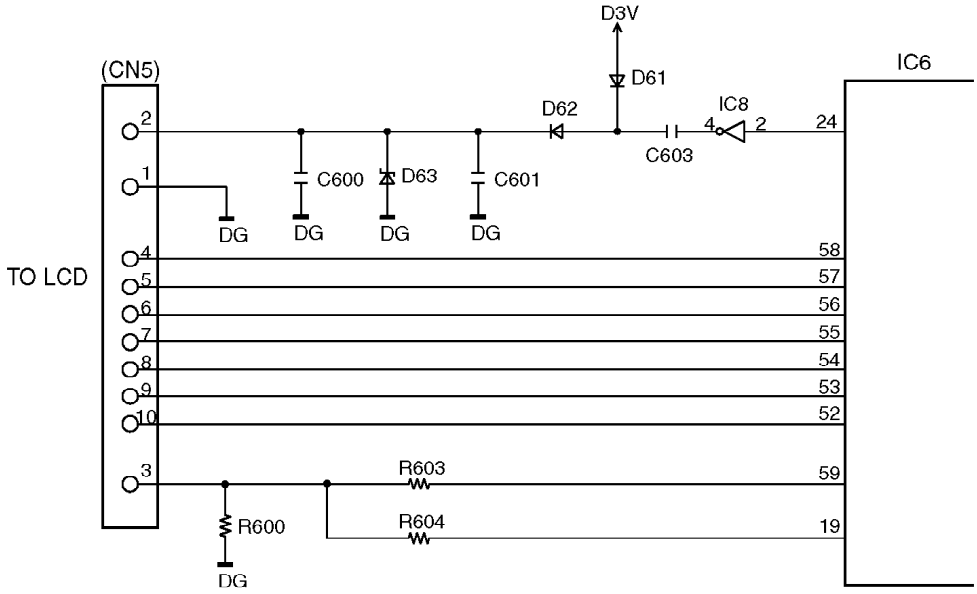
10.2. LCD CONTROL CIRCUIT

The LCD data is output from pins 52 to 58 of IC6.

LCD contrast adjustment is performed by the circuit composed of R603 and R604.

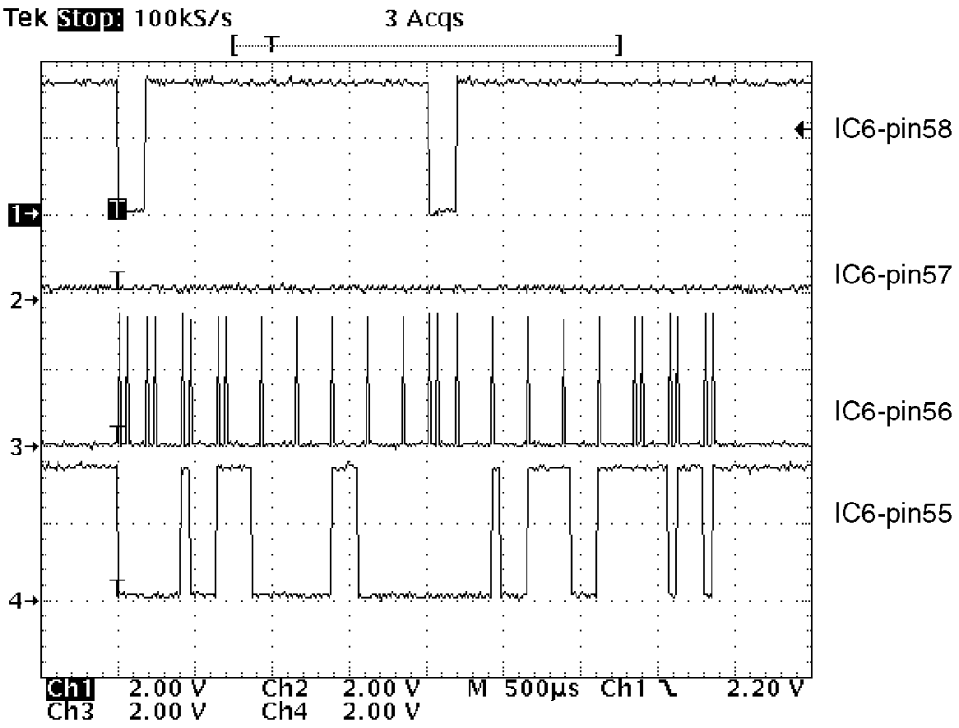
The contrast is determined only by the voltage level between pin 2 and pin 3 of CN5. Higher potential makes the contrast high.

CIRCUIT DIAGRAM



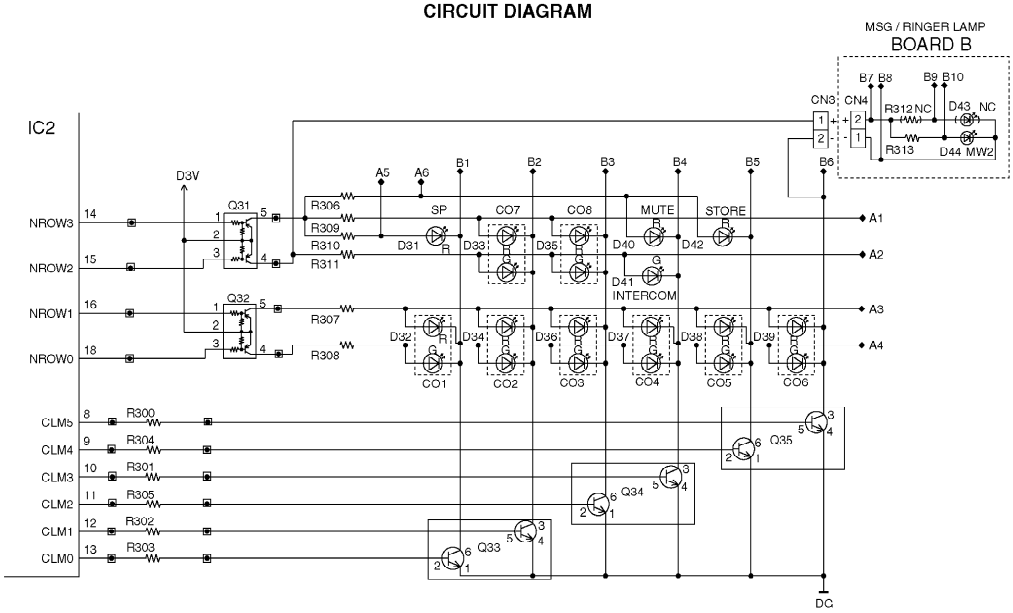
LCD Contrast Control

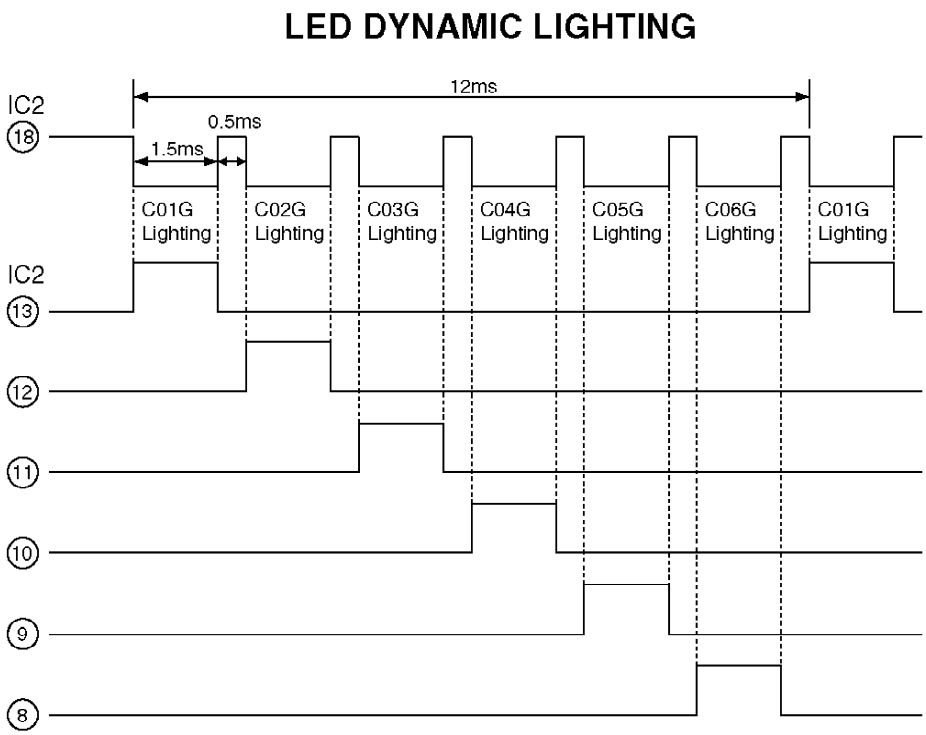
CONTRAST	IC6 Pin 59	IC6 Pin19
HIGH	L	L
MIDDLE	Z	L
LOW	Z	Z



10.3. LED CIRCUIT

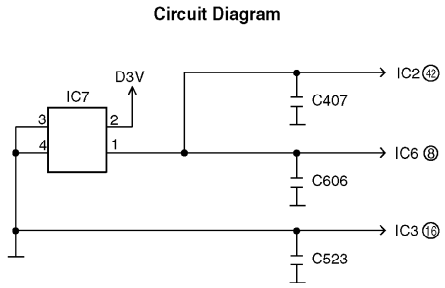
The lighting of the LED is controlled by pin 14 to 18 (Row) and pin 8 to 13 (Colum) of IC2.
The LED lights up in a dynamic lighting system.
The duty ratio is 1/8 (ON time 1.5ms).

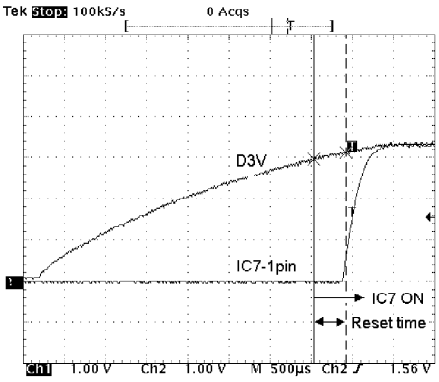




10.4. RESET CIRCUIT

Reset Signal is outputted from IC7 and inputted into IC2, IC3 and IC6 at the connection of TEL cord.





10.5. POWER SUPPLY CIRCUIT

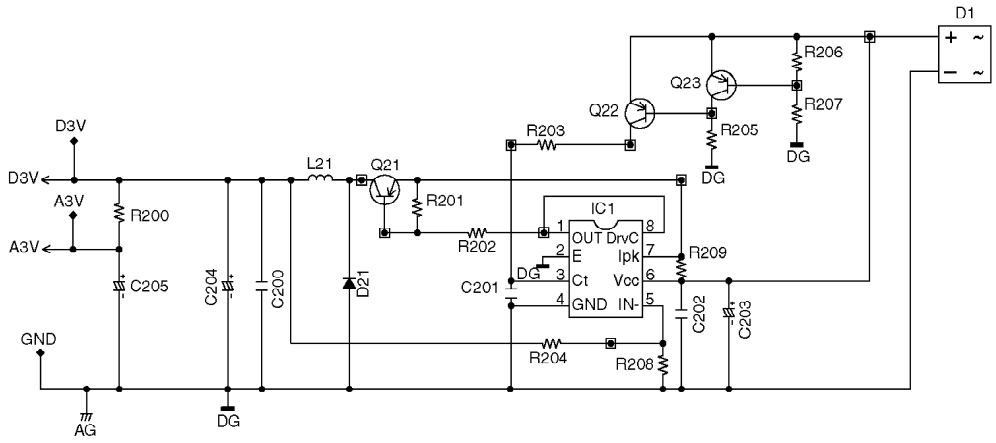
This circuit converts the voltage supplied from PBX into the power supply voltage of +3.3V by IC1 (Switching Regulator IC).

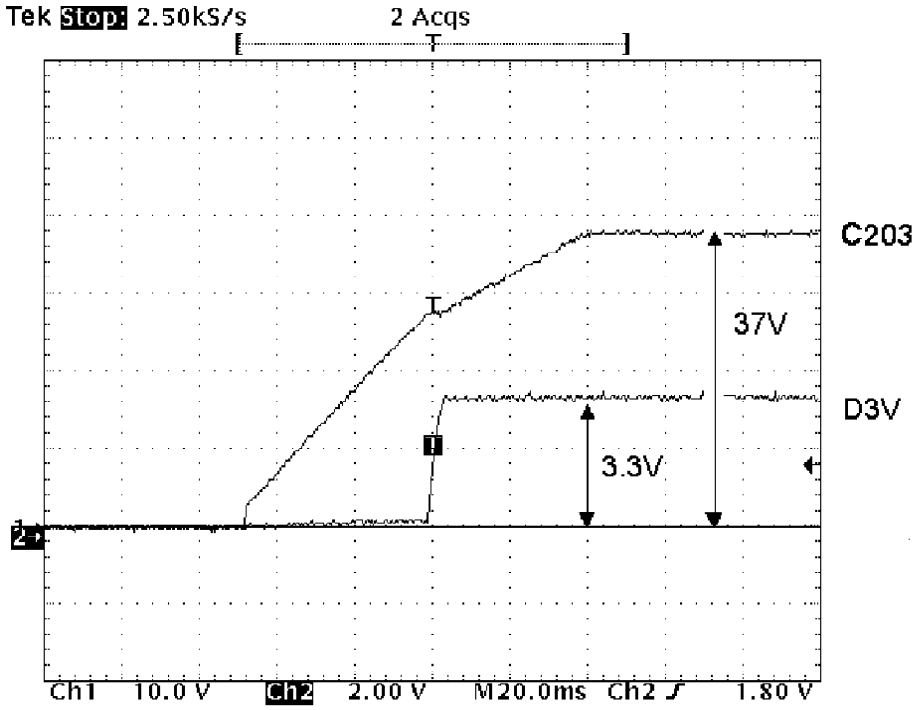
Q22 and Q23 control the power supply circuit as below to turn IC1 on in low consumption current at starting up.

- Input Voltage approx. 26V or less → Q23 OFF → Q22 ON → IC1-pin 3 H → IC1 OFF

- Input Voltage approx. 26V or more → Q23 ON → Q22 OFF → IC1 ON

CIRCUIT DIAGRAM





10.6. DATA COMMUNICATION

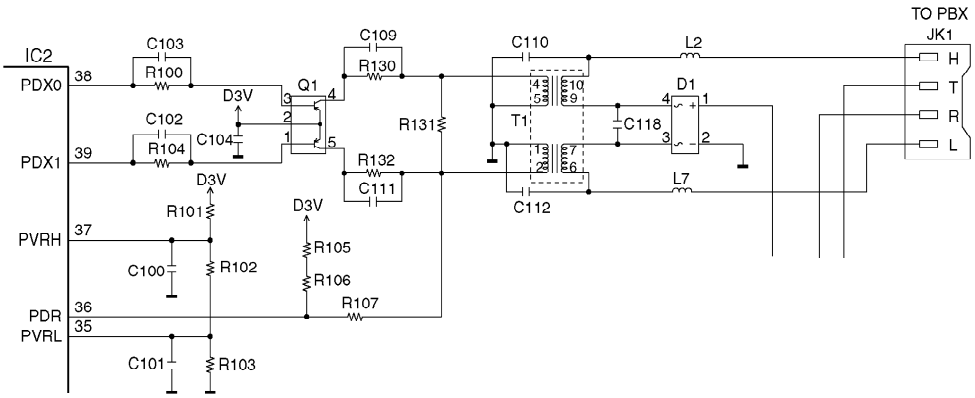
Function

The data communication circuit serves the following functions:
Information exchanger between PBX and proprietary telephone, key input information as well as data for the LED control, LCD control, voice data, etc. This information is continuously exchanged at all times.

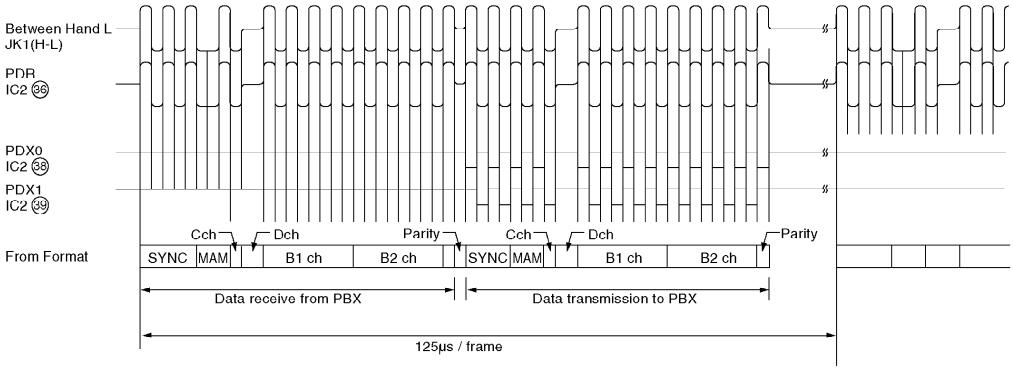
Circuit Operation

The data received from PBX is inputted to the comparator (pin 36) built in IC2 through Pulse Trans T1. The threshold voltage of the comparator is determined by R101 to 103 and inputted to pin 37 and 35 of IC2.
The data to PBX is outputted from pin 38 and 39 of IC2, drives T1 by Transistor Q1 and transmitted.

Circuit Diagram



TIMING CHART FOR D-PITS TRANSMISSION



10.7. DXDP COMMUNICATION

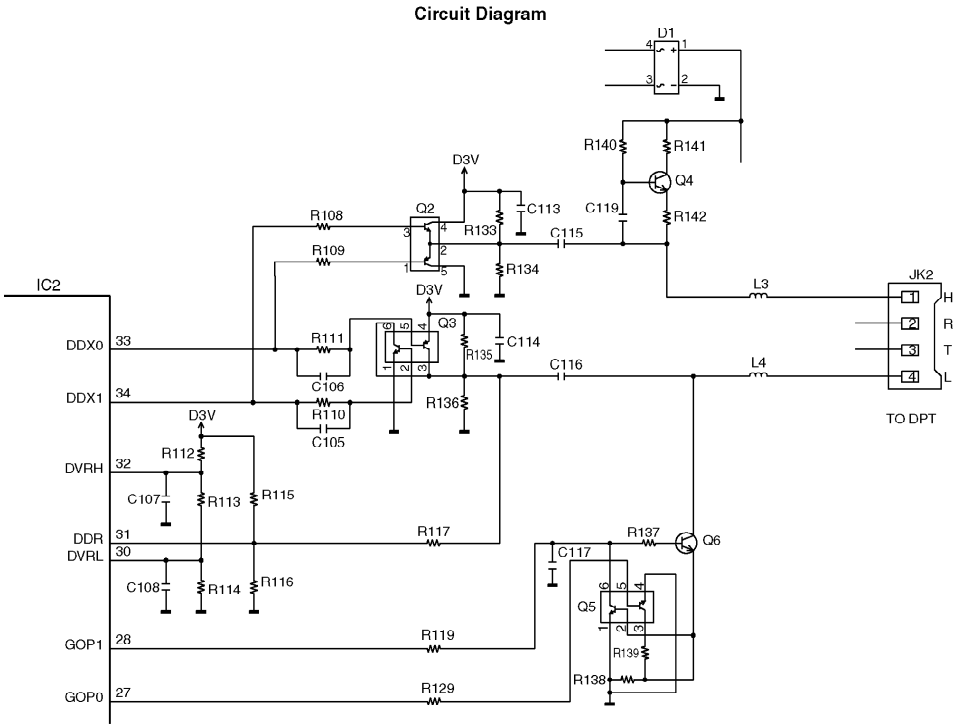
Function

This circuit performs the same communication as DXDP-compatible DPT and PBX communication connected with DXDP port.

Circuit Operation

The data to Slave DPT is outputted from pin 33 and 34 of IC2 and sent by Transistor Q2 and Q3.
The data from Slave DPT is inputted to the comparator (pin 31) built in IC2.
The threshold voltage of the comparator is determined by R112 to 114 and inputted to pin 30 and 32 of IC2.
Also, the supplying power to Slave DPT is controlled by a constant current circuit of Q16 as below.

- IC2-pin 28 as H : Constant current circuit ON
- IC2-pin 28 as L : Constant current circuit OFF
- IC2-pin 29 as H : 40mA Feeding (Slave DPT usually)
- IC2-pin 29 as L : 20mA Feeding (Slave DPT at starting up only)



10.8. ANALOG CIRCUIT

This circuit performs the setting of the call path/vol. adjustment in each call mode by IC4. The audio gain of each call is determined by download data from PBX.

- IC2 sends each audio data to IC3 by PCM interface.

- IC2 receives each audio data from IC3 by PCM interface.

1. Handset Call

Transmitting signal is inputted from handset microphone and amplified by IC4 built-in Amp → A/D conversion → Gain adjustment by IC4 → inputted to IC3 and IC2 in PCM data → then sent to PBX.

Receiving signal is inputted from PBX → IC2 → IC3 → D/A conversion after the input to IC4 in PCM data → Gain adjustment by DSP of IC4 → Pin 26 of IC4 → outputted from Q51 to handset.

2. Speakerphone Call

The speakerphone mode can only provide a one-way communication path.

IC3 compares transmitting signal and receiving signal during speakerphone mode, then provide a one-way communication path.

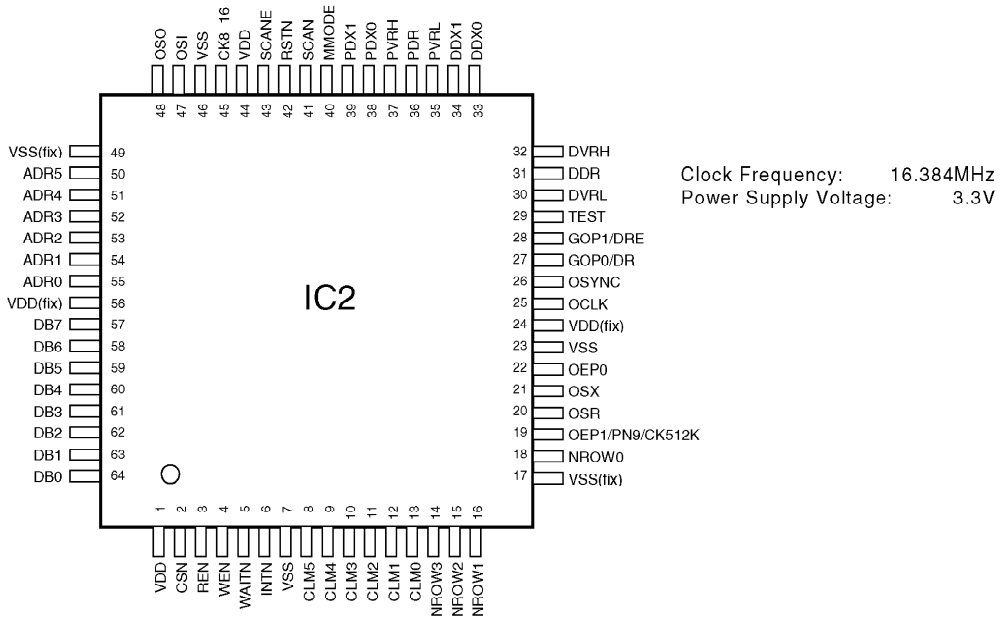
Transmitting signal is inputted from SP phone mic. and amplified by IC4 built-in Amp → A/D conversion → inputted to IC3 in PCM

data → Gain adjustment by IC3 → inputted to IC2 → then sent to PBX.

Receiving signal is inputted from PBX is → IC2 → Gain adjustment by IC3 → inputted to IC4 in PCM data → D/A conversion → pin 24 of IC4 → pin 27 of IC4 → pin 28 of IC4 → pin 29 of IC4 → outputted from pin 3 and 4 of IC4 to speaker.

11. IC DATA

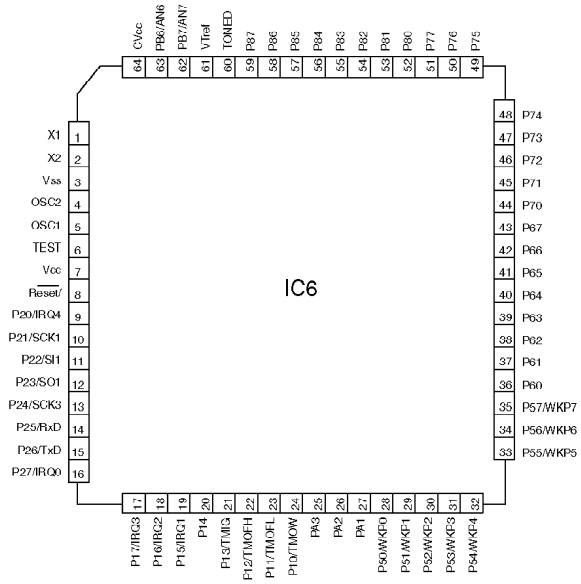
11.1. IC2



Pin	No.	I/O Setting	Pull-up Processing	Contents of Control	Remark
1	VDD	-	-	Vdd	
2	CSN	in	Built-in	chip select	
3	REN	in	Built-in	Read	
4	WEN	in	Built-in	Write	
5	WAITN	tri	-	Wait	
6	INTN	out	-	Interrupt out	
7	VSS	-	-	GND	
8	CLM5	out	-	LED column 5	
9	CLM4	out	-	LED column 4	
10	CLM3	out	-	LED column 3	
11	CLM2	out	-	LED column 2	
12	CLM1	out	-	LED column 1	
13	CLM0	out	-	LED column 0	
14	NROW3	out	-	LED Row 3	
15	NROW2	out	-	LED Row 2	
16	NROW1	out	-	LED Row 1	
17	VSS	-	-	GND	
18	NROW0	out	-	LED Row 0	
19	OEP1/PN9/ CK512K	tri	-	enable pulse	
20	OSR	in	Built-in	2.048MHz serial data input	
21	OSX	tri		2.048MHz serial data output	
22	OEP0	tri	-	enable pulse	
23	VSS	-	-	GND	
24	VDD	-	-	Vdd	
25	OCLK	bi	-	2.048MHz serial clock	
26	OSYNC	bi	-	8Khz FS	
27	GOP0	out	-	DXDP1	H:40mA L: 20mA
28	GOP1	out	-	DXDP2	H:ON L:OFF
29	TEST	in	-	TEST	
30	DVRL	in	-	Comp. Ref.	
31	DDR	in	-	Comp. Input	
32	DVRH	in	-	Comp. Ref.	
33	DDX0	out	-	Tx DATA OUT0	
34	DDX1	tri	-	Tx DATA OUT1	
35	PVRL	in	-	Comp. Ref.	
36	PDR	in	-	Comp. Input	
37	PVRH	in	-	Comp. Ref.	
38	PDX0	out	-	Tx DATA OUT0	
39	PDX1	out	-	Tx DATA OUT1	
40	MMODE	in	-	Mode	

Pin	No.	I/O Setting	Pull-up Processing	Contents of Control	Remark
41	SCAN	in	Pull Down	scan	
42	RSTN	in	-	Reset	
43	SCANE	in	Pull Down	scan test	
44	VDD	-	-	Vdd	
45	CK8_16	tri	-	8MHz clock out	
46	VSS	-	-	GND	
47	OSI	in	-	OSC	
48	OSO	out	-	OSC	
49	VSS	-	-	GND	
50	ADR5	in	Built-in	Add.5	
51	ADR4	in	Built-in	Add.4	
52	ADR3	in	Built-in	Add.3	
53	ADR2	in	Built-in	Add.2	
54	ADR1	in	Built-in	Add.1	
55	ADR0	in	Built-in	Add.0	
56	VDD	-	-	Vdd	
57	DB7	bi	Built-in	Data 7	
58	DB6	bi	Built-in	Data 6	
59	DB5	bi	Built-in	Data 5	
60	DB4	bi	Built-in	Data 4	
61	DB3	bi	Built-in	Data 3	
62	DB2	bi	Built-in	Data 2	
63	DB1	bi	Built-in	Data 1	
64	DB0	bi	Built-in	Data 0	

11.2. IC6

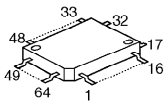


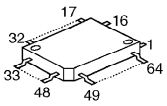
Program ROM:	40kbyte(8bit)
Internal RAM:	2kbyte
Clock Frequency:	8.192MHz
Power Supply Voltage:	3.3V

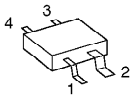
Pin	No.	I/O Setting	Pull-up Processing	Contents of Control	Remark
1	X1	I	-	not in use	
2	X2	O	-	not in use	
3	Vss		-	GND	
4	OSC2	O	-	not in use	
5	OSC1	I	-	8.192MHz clock	from IC2
6	TEST	I	-	not in use	
7	Vcc		-	Vcc	
8	Reset/	I	-	Reset input	
9	P20/IRQ4	O	-	CODEC chip select	
10	P21/SCK1	O	-	SCLK	
11	P22/SI1	O	-	Sp Phone chip select	
12	P23/SO1	O	-	DATA	
13	P24/SCK3	O	-	not in use	
14	P25/RxD	I	Built-in	not in use	
15	P26/TxD	O	-	not in use	
16	P27/IRQ0	I	-	not in use	
17	P17/IRQ3	I	Built-in	Hook SW	L:OFF-HOOK
18	P16/IRQ2	I	Built-in	ASIC INT/	Low active
19	P15/IRQ1	I/O	-	LCD contrast 2	Cont.H/M:L Cont.L: High"Z"
20	P14	I/O	Built-in	KEYOUT3	L output
21	P13/TMIG	I/O	Built-in	KEYOUT2	L output
22	P12/TMOFH	I/O	Built-in	KEYOUT1	L output
23	P11/TMOFL	I/O	Built-in	KEYOUT0	L output
24	P10/TMOW	O	-	OSC for LCD Power	128kHz(4.096MHz/32)
25	PA3	O	-	side tone Cont.	H:side tone ON
26	PA2	O	-	ASIC REN/	Low active
27	PA1	O	-	ASIC WEN/	Low active
28	P50/WKP0	I	Built-in	KEYIN0	
29	P51/WKP1	I	Built-in	KEYIN1	
30	P52/WKP2	I	Built-in	KEYIN2	
31	P53/WKP3	I	Built-in	KEYIN3	
32	P54/WKP4	I	Built-in	KEYIN4	
33	P55/WKP5	I	Built-in	KEYIN5	
34	P56/WKP6	I	Built-in	KEYIN6	
35	P57/WKP7	I	Built-in	KEYIN7	
36	P60	I/O	Built-in	DB0	
37	P61	I/O	Built-in	DB1	
38	P62	I/O	Built-in	DB2	
39	P63	I/O	Built-in	DB3	
40	P64	I/O	Built-in	DB4	

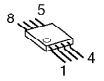
Pin	No.	I/O Setting	Pull-up Processing	Contents of Control	Remark
41	P65	I/O	Built-in	DB5	
42	P66	I/O	Built-in	DB6	
43	P67	I/O	Built-in	DB7	
44	P70	O	-	ADR0	
45	P71	O	-	ADR1	
46	P72	O	-	ADR2	
47	P73	O	-	ADR3	
48	P74	O	-	ADR4	
49	P75	O	-	ADR5	
50	P76	O	-	EEPROM CLK	
51	P77	I/O	-	EEPROM DATA	
52	P80	O	-	LCD_D7	
53	P81	O	-	LCD_D6	
54	P82	O	-	LCD_D5	
55	P83	O	-	LCD_D4	
56	P84	O	-	LCD_E	
57	P85	O	-	LCD_W	
58	P86	O	-	LCD_RS	register select
59	P87	O	-	LCD contrast 1	Cont.H:L Cont.M/L: High"Z"
60	TONED	O	-	DTMF/Tone	Tone out
61	VTref	I	-	Tone reference	
62	PB7/AN7	I	-	for Test MODE	connect D3V for Sp phone test
63	PB6/AN6	I	-	not in use	
64	CVcc	I	-	internal power source	

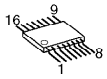
12. TERMINAL GUIDE OF ICs, TRANSISTORS AND DIODES

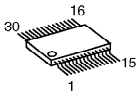
<table>
<tr>
<td> 

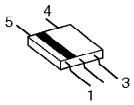
C2BBGF000244</td>
<td> 

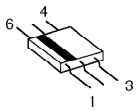
C1CB00001612</td>
<td> 

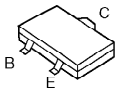
C0EBF0000123</td>
<td> 

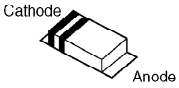
PQVIMC34063M
C3EBCC000052</td>
<td> 

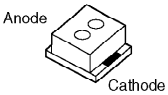
C1CB00001623</td>
</tr>
<tr>
<td> 

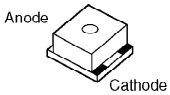
C1CB00001622</td>
<td colspan="2"> 

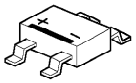
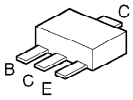
B1GHCFCJ0001, PSVTUMS1NTR
PQVITC7SH04F, B1HFCFA00008</td>
<td> 

XP4601
PSVTUMX1NTN</td>
<td> 

2SA1576R
2SC4081R
B1ABMF000004</td>
</tr>
<tr>
<td> 

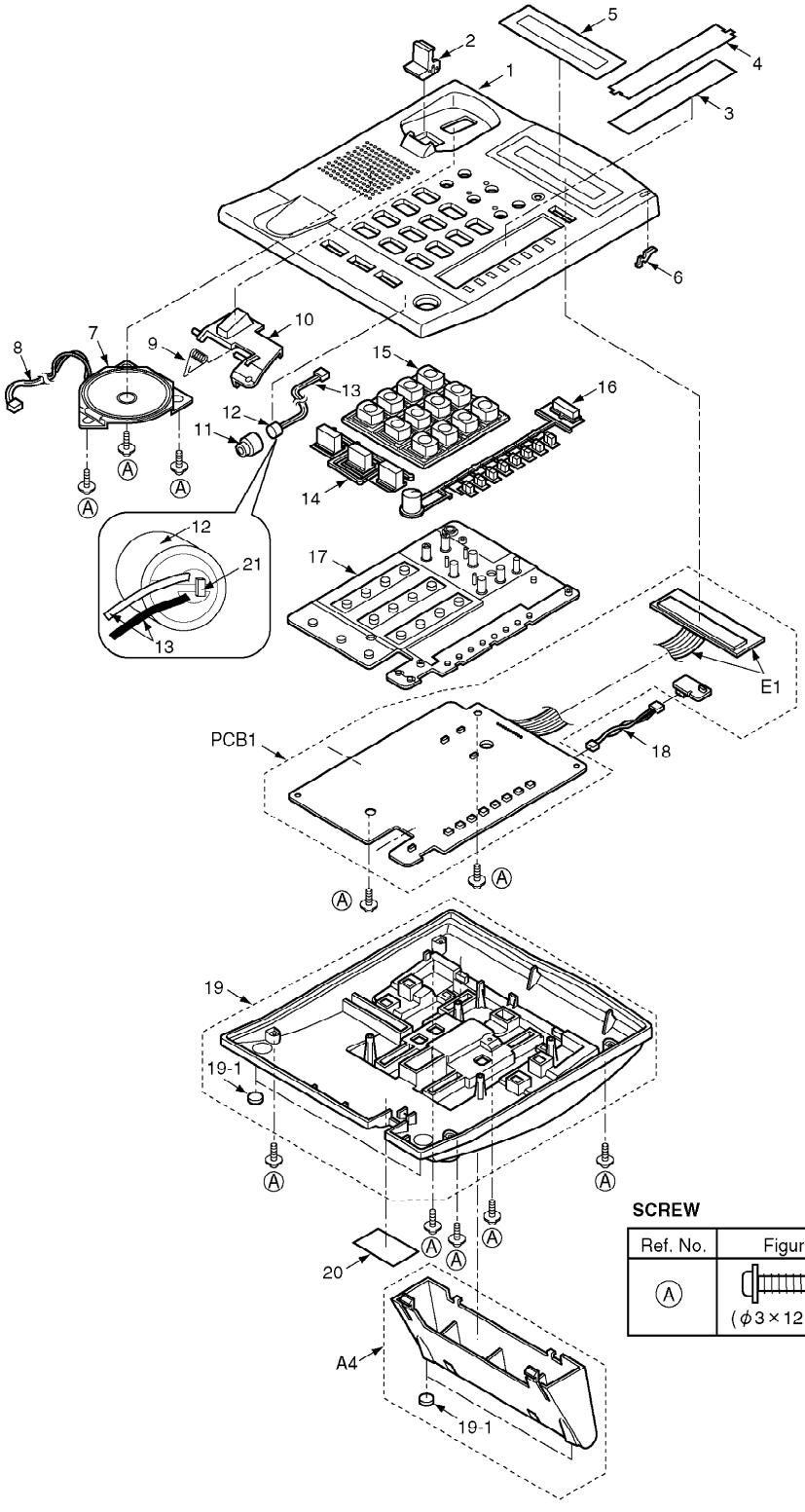
B0BC5R000009
B0JCME000035
MA729</td>
<td> 

PQVDBRPY1204</td>
<td> 

PSVD1SRCT
PSVD1VGCT</td>
<td> 
PQVDS1ZB60F1</td>
<td> 

2SA1900</td>
</tr>
</table>

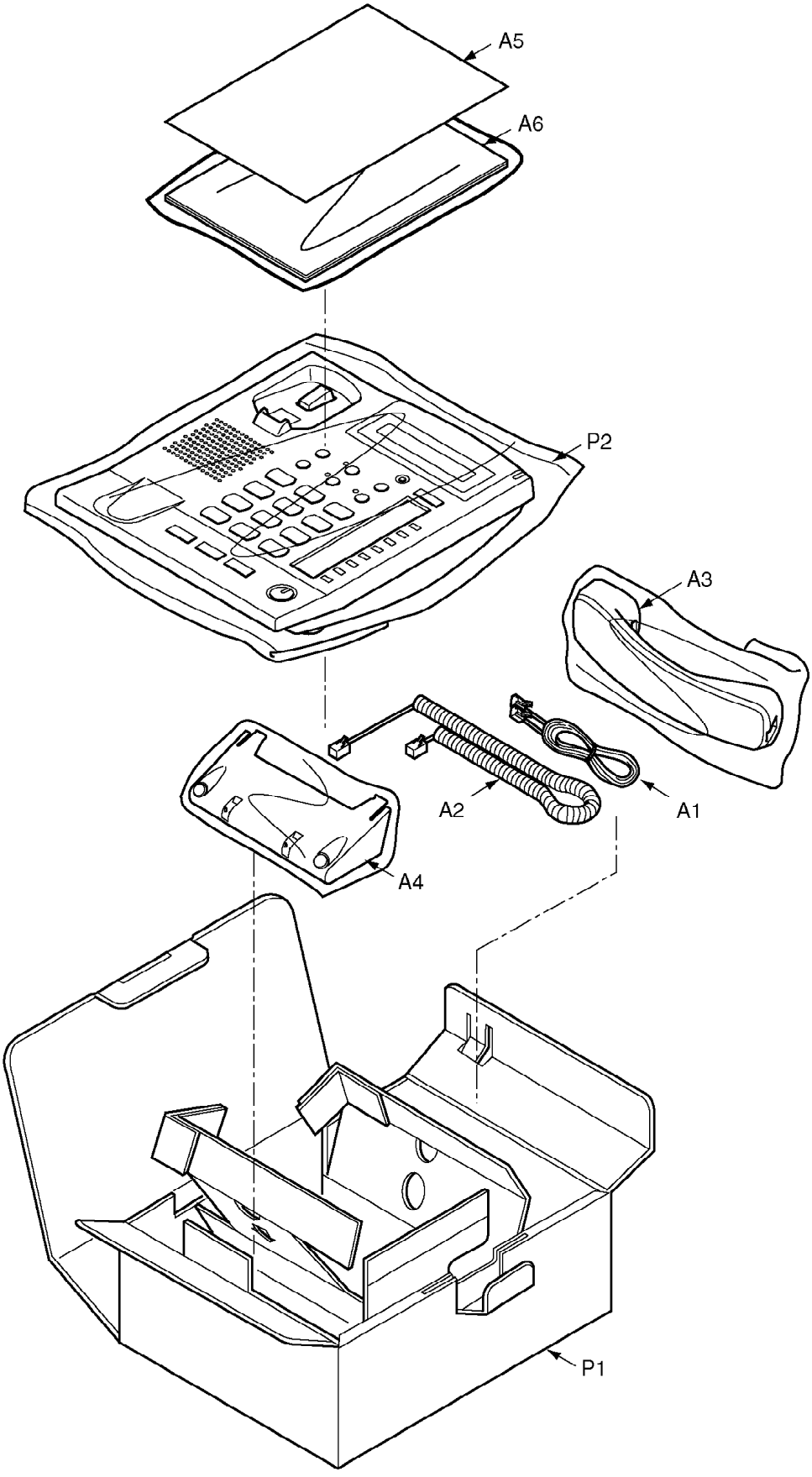
13. CABINET AND ELECTRICAL PARTS LOCATION



SCREW

Ref. No.	Figure	Part No.
Ⓐ	(φ3×12 mm)	XTW3+S12P

14. ACCESSORIES AND PACKING MATERIALS


A5
A6
P2
A3
A2
A1
A4
P1

15. REPLACEMENT PARTS LIST

1. **RTL (Retention Time Limited)**
   Note:
   The marking (RTL) indicates that the Retention Time is limited for this item.
   After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly, and in accordance with the laws governing parts and product retention.
   After the end of this period, the assembly will no longer be available.
2. **Important safety notice**
   Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.
3. **The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.**
4. **ISO code (Example: ABS-HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.**
5. **RESISTORS & CAPACITORS**
   Unless otherwise specified;
   All resistors are in ohms (Ω) K=1000 Ω , M=1000k Ω
   All capacitors are in MICRO FARADS (μ F) P= μ μ F
   ***Type & Wattage of Resistor**

Type

ERC:Solid ERD:Carbon PQRD:Carbon	ERX:Metal Film ERG:Metal Oxide ER0:Metal Film	PQ4R:Carbon ERS:Fusible Resistor ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W

*Type & Voltage of Capacitor

Type

ECFD:Semi-Conductor ECQS:Styrol PQCUV:Chip ECQMS:Mica	ECCD,ECKD,ECBT,PQCBC : Ceramic ECQE,ECQV,ECQG : Polyester ECEA,ECSZ : Electrolytic ECQP : Polypropylene

Voltage

ECQ Type	ECQG ECQV Type	ECSZ Type	Others	
1H: 50V 2A:100V 2E:250V 2H:500V	05: 50V 1:100V 2:200V	0F:3.15V 1A:10V 1V:35V 0J:6.3V	0J :6.3V 1A :10V 1C :16V 1E,25:25V	1V :35V 50,1H:50V 1J :63V 2A :100V

15.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PSKM1110Y1	CABINET BODY (for KX-T7665NE)	ABS-HB, S
1	PSKM1110Y2	CABINET BODY (for KX-T7665NE-B)	ABS-HB, S
2	PQKE10070Z3	HANGER (for KX-T7665NE)	ABS-HB, S
2	PQKE10070Z1	HANGER (for KX-T7665NE-B)	ABS-HB, S
3	PSGD1073Z	TEL. CARD	
4	PSHR1305Z	TRANSPARENT PLATE	PC-HB
5	PSGP1101Z1	PANEL, LCD (for KX-T7665NE)	PC-HB, S
5	PSGP1101Z2	PANEL, LCD (for KX-T7665NE-B)	PC-HB, S
6	PSGP1100Z	OPTIC CONDUCTIVE PARTS, LED LENS	ABS-HB
7	PQAS57P03Z	SPEAKER	
8	PSJS02P15Z	CONNECTOR, 2 PIN	
9	PSUS1026Z	TORSION SPRING	
10	PSBH1007Z1	PUSH BUTTON, HOOK (for KX-T7665NE)	PC+ABS-HB, S
10	PSBH1007Z2	PUSH BUTTON, HOOK (for KX-T7665NE-B)	PC+ABS-HB, S
11	PSHG1122Z	RUBBER PARTS, MIC COVER	
12	RJM142Z	BUILTIN-MICROPHONE	S
13	PSJS02Q35Y	CONNECTOR, 2 PIN	
14	PSBX1116Z1	PUSH BUTTON, FUNCTION (for KX-T7665NE)	ABS-HB, S
14	PSBX1116Z2	PUSH BUTTON, FUNCTION (for KX-T7665NE-B)	ABS-HB, S
15	PSBX1089Z1	PUSH BUTTON, 12 KEY	ABS-HB, S
16	PSBX1117Z1	PUSH BUTTON, CO LINE (for KX-T7665NE)	ABS-HB, S
16	PSBX1117Z2	PUSH BUTTON, CO LINE (for KX-T7665NE-B)	ABS-HB, S
17	PSSX1030Z1	KEYBOARD SWITCH (for KX-T7665NE)	S
17	PSSX1030Z2	KEYBOARD SWITCH (for KX-T7665NE-B)	S

Ref. No.	Part No.	Part Name & Description	Remarks
18	PSJS02P10Z	CONNECTOR, 2 PIN	
19	PSYF1047Z1	CABINET COVER ASS'Y (for KX-T7665NE)	PS-HB, S
19	PSYF1047Z2	CABINET COVER ASS'Y (for KX-T7665NE-B)	PS-HB, S
19-1	PSHA1002Z	RUBBER PARTS, FOOT	
20	PSYET7665NE	NAME PLATE (for KX-T7665NE)	
20	PSYET7665NEB	NAME PLATE (for KX-T7665NE-B)	
21	ECUV1H102KBV	CERAMIC CAPACITOR (0.001)	

15.2. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PSJA1068Z	CORD, TELEPHONE	S
A2	PSJA1084Z	CORD, HANDSET (for KX-T7665NE)	
A2	PSJA1084X	CORD, HANDSET (for KX-T7665NE-B)	
A3	PQJXF0202Z	HANDSET (for KX-T7665NE)	
A3	PQJXF0222Z	HANDSET (for KX-T7665NE-B)	
A4	PSYL1002Z3	STAND ASS'Y (for KX-T7665NE)	PS-HB
A4	PSYL1002Z2	STAND ASS'Y (for KX-T7665NE-B)	PS-HB
A5	PSQW2038Z	LEAFLET (STAND)	
A6	PSZE1036Z	INSTRUCTION BOOK KIT (QUICK REFERENCE GUIDE)	
P1	PSZKT7665NE	GIFT BOX ASS'Y (for KX-T7665NE)	
P1	PSZKT7665NEB	GIFT BOX ASS'Y (for KX-T7665NE-B)	
P2	PQPP170Z	PROTECTION COVER	

15.3. MAIN BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PSWPT7665NE	MAIN BOARD ASS'Y (RTL)	
		(ICs)	
IC1	PQVIMC34063M	IC	S
IC2	C1CB00001612	IC	
IC3	C1CB00001623	IC	
IC4	C1CB00001622	IC	
IC5	C3EBCC000052	IC	
IC6	C2BBGF000486	IC	
IC7	C0EBF0000123	IC	
IC8	PQVITC7SH04F	IC	S
		(TRANSISTORS)	
Q1	PSVTUMS1NTR	TRANSISTOR(SI)	S
Q2	B1HFCFA00008	TRANSISTOR(SI)	
Q3	XP4601	TRANSISTOR(SI)	S
Q4	2SC4081R	TRANSISTOR(SI)	S
Q5	PSVTUMX1NTN	TRANSISTOR(SI)	
Q6	B1ABMF000004	TRANSISTOR(SI)	
Q21	2SA1900	TRANSISTOR(SI)	S
Q22	2SA1576R	TRANSISTOR(SI)	
Q23	2SA1576R	TRANSISTOR(SI)	
Q31	B1GHCFCJ0001	TRANSISTOR(SI)	
Q32	B1GHCFCJ0001	TRANSISTOR(SI)	
Q33	PSVTUMX1NTN	TRANSISTOR(SI)	
Q34	PSVTUMX1NTN	TRANSISTOR(SI)	
Q35	PSVTUMX1NTN	TRANSISTOR(SI)	
Q51	2SC4081R	TRANSISTOR(SI)	S
Q52	2SC4081R	TRANSISTOR(SI)	S
		(DIODES)	
D1	PQVDS1ZB60F1	DIODE(SI)	S
D21	B0JCME000035	DIODE(SI)	
D31	PSVD1SRCT	DIODE(SI)	S
D32	PQVDBRPY1204	DIODE(SI)	S
D33	PQVDBRPY1204	DIODE(SI)	S
D34	PQVDBRPY1204	DIODE(SI)	S
D35	PQVDBRPY1204	DIODE(SI)	S
D36	PQVDBRPY1204	DIODE(SI)	S
D37	PQVDBRPY1204	DIODE(SI)	S
D38	PQVDBRPY1204	DIODE(SI)	S
D39	PQVDBRPY1204	DIODE(SI)	S
D40	PSVD1SRCT	DIODE(SI)	S
D41	PSVD1VGCT	DIODE(SI)	S
D42	PSVD1SRCT	DIODE(SI)	S
D44	PSVD1SRCT	DIODE(SI)	S
D61	MA729	DIODE(SI)	S
D62	MA729	DIODE(SI)	S
D63	B0BC5R000009	DIODE(SI)	
		(CONNECTORS)	
CN1	PSJP02A05Z	CONNECTOR, 2 PIN	S
CN2	PSJP02A05Z	CONNECTOR, 2 PIN	S
CN3	PSJP02A05Z	CONNECTOR, 2 PIN	S

Ref. No.	Part No.	Part Name & Description	Remarks
CN4	PSJP02A05Z	CONNECTOR, 2 PIN	S
		(JACKS)	
JK1	PSJJ1T011Z	JACK, TELEPHONE LINE	S
JK2	PSJJ1T011Z	JACK, DXDP	S
JK3	PSJJ1T012Z	JACK, HANDSET	S
		(CERAMIC FILTERS)	
L1	PFVF1B601ST	CERAMIC FILTER	S
L2	PFVF1B601ST	CERAMIC FILTER	S
L3	PFVF1B601ST	CERAMIC FILTER	S
L4	PFVF1B601ST	CERAMIC FILTER	S
L51	PFVF1B601ST	CERAMIC FILTER	S
L52	PFVF1B601ST	CERAMIC FILTER	S
		(COIL)	
L21	G1A331D00005	COIL	
		(RESISTORS)	
R100	ERJ3GEYJ182	1.8K	
R101	ERJ3GEYJ822	8.2K	
R102	ERJ3GEYJ562	5.6K	
R103	ERJ3GEYJ123	12K	
R104	ERJ3GEYJ182	1.8K	
R105	ERJ3GEYJ122	1.2K	
R106	ERJ3GEYJ121	120	
R107	ERJ3GEYJ182	1.8K	
R108	ERJ3GEYJ101	100	
R109	ERJ3GEYJ101	100	
R110	ERJ3GEYJ122	1.2K	
R111	ERJ3GEYJ122	1.2K	
R112	ERJ3GEYJ562	5.6K	
R113	ERJ3GEYJ682	6.8K	
R114	ERJ3GEYJ103	10K	
R115	ERJ3GEYJ472	4.7K	
R116	ERJ3GEYJ153	15K	
R117	ERJ3GEYJ472	4.7K	
R119	ERJ3GEYJ822	8.2K	
R129	ERJ3GEYJ123	12K	
R130	ERJ3GEYJ220	22	
R131	ERJ3GEYJ271	270	
R132	ERJ3GEYJ220	22	
R133	ERJ3GEYJ561	560	
R134	ERJ3GEYJ331	330	
R135	ERJ3GEYJ561	560	
R136	ERJ3GEYJ331	330	
R137	ERJ3GEYJ102	1K	
R138	ERJ3GEYJ270	27	
R139	ERJ3GEYJ180	18	
R140	ERJ3GEYJ562	5.6K	
R141	ERJ3GEYJ330	33	
R142	ERJ3GEYJ100	10	
R200	ERJ6GEYJ3R3	3.3	
R201	ERJ3GEYJ221	220	

Ref. No.	Part No.	Part Name & Description	Remarks
R202	PQ4R10XJ562	5.6K	S
R203	ERJ3GEYJ153	15K	
R204	ERJ3GEYJ392	3.9K	
R205	ERJ3GEYJ104	100K	
R206	ERJ3GEYJ472	4.7K	
R207	ERJ3GEYJ224	220K	
R208	ERJ3GEYJ242	2.4K	
R209	ERJ3GEYJ1R2	1.2	
R300	ERJ3GEYJ102	1K	
R301	ERJ3GEYJ102	1K	
R302	ERJ3GEYJ102	1K	
R303	ERJ3GEYJ102	1K	
R304	ERJ3GEYJ102	1K	
R305	ERJ3GEYJ102	1K	
R306	ERJ3GEYJ181	180	
R307	ERJ3GEYJ121	120	
R308	ERJ3GEYJ120	12	
R309	ERJ3GEYJ121	120	
R310	ERJ3GEYJ121	120	
R311	ERJ3GEYJ120	12	
R313	ERJ3GEYJ4R7	4.7	
R400	ERJ3GEYJ821	820	
R401	ERJ3GEYJ105	1M	
R402	ERJ3GEYJ473	47K	
R403	ERJ3GEYJ181	180	
R406	ERJ3GEYJ473	47K	
R407	ERJ3GEYJ473	47K	
R500	ERJ3GEYJ102	1K	
R501	ERJ3GEYJ222	2.2K	
R502	ERJ3GEYJ103	10K	
R503	ERJ3GEYJ102	1K	
R504	ERJ3GEYJ103	10K	
R505	ERJ3GEYJ102	1K	
R506	ERJ3GEYJ222	2.2K	
R507	ERJ3GEYJ563	56K	
R508	ERJ3GEYJ822	8.2K	
R509	ERJ3GEYJ333	33K	
R510	ERJ3GEYJ473	47K	
R511	ERJ3GEYJ223	22K	
R512	ERJ3GEYJ274	270K	
R513	ERJ3GEY0R00	0	
R514	ERJ3GEY0R00	0	
R515	ERJ3GEYJ473	47K	
R516	ERJ3GEYJ473	47K	
R517	ERJ3GEYJ473	47K	
R518	ERJ3GEYJ102	1K	
R519	ERJ3GEYJ102	1K	
R520	ERJ3GEYJ102	1K	
R521	ERJ3GEYJ102	1K	
R522	ERJ3GEYJ124	120K	
R523	ERJ3GEYJ473	47K	
R524	ERJ3GEYJ473	47K	
R525	ERJ3GEYJ473	47K	
R526	ERJ3GEYJ473	47K	

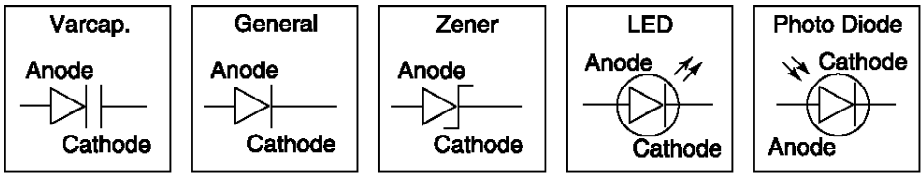
Ref. No.	Part No.	Part Name & Description	Remarks
R527	ERJ3GEYJ100	10	
R600	ERJ3GEYJ822	8.2K	
R602	ERJ3GEYJ473	47K	
R603	ERJ3GEYJ822	8.2K	
R604	ERJ3GEYJ183	18K	
R605	ERJ3GEYJ682	6.8K	
R606	ERJ3GEYJ472	4.7K	
R607	ERJ3GEYJ182	1.8K	
R608	ERJ3GEYJ181	180	
R609	ERJ3GEYJ181	180	
R611	ERJ3GEYJ473	47K	
		(CAPACITORS)	
C100	ECUV1C104ZFV	0.1	
C101	ECUV1C104ZFV	0.1	
C102	ECUV1H102KBV	0.001	
C103	ECUV1H102KBV	0.001	
C104	ECUV1C104ZFV	0.1	
C105	ECUV1H102KBV	0.001	
C106	ECUV1H102KBV	0.001	
C107	ECUV1C104ZFV	0.1	
C108	ECUV1C104ZFV	0.1	
C109	ECUV1A105ZFV	1	
C110	ECUV1H101JCV	100P	
C111	ECUV1A105ZFV	1	
C112	ECUV1H101JCV	100P	
C113	ECUV1C104ZFV	0.1	
C114	ECUV1C104ZFV	0.1	
C115	PQCUV1C105ZF	1	S
C116	PQCUV1C105ZF	1	S
C117	ECUV1A105ZFV	1	
C118	PQCUV1C105ZF	1	S
C119	ECUV1A105ZFV	1	
C200	ECUV1C104ZFV	0.1	
C201	ECUV1H181JCV	180P	S
C202	ECUV1H104ZFV	0.1	S
C203	F2G1H3300004	33	
C204	EEEFK0J471P	470	
C205	EEEFK0J471P	470	
C400	ECUV1C104ZFV	0.1	
C401	ECUV1C104ZFV	0.1	
C402	ECUV1C104ZFV	0.1	
C403	ECUV1C104ZFV	0.1	
C404	ECUV1H120JCV	12P	
C405	ECUV1H120JCV	12P	
C406	ECUV1H120JCV	12P	
C407	ECUV1C104ZFV	0.1	
C500	ECUV1H222KBV	0.0022	
C501	ECUV1H102KBV	0.001	
C502	ECUV1C104KBV	0.1	
C504	ECUV1E103KBV	0.01	
C506	ECUV1H333KBV	0.033	S
C507	ECUV1H152KBV	0.0015	
C508	ECUV1C104KBV	0.1	

Ref. No.	Part No.	Part Name & Description	Remarks
C509	ECUV1H152KBV	0.0015	
C510	ECUV1H223KBV	0.022	S
C511	ECUV1C104KBV	0.1	
C512	ECUV1E103KBV	0.01	
C513	ECUV1C104KBV	0.1	
C514	ECUV1H181JCV	180P	S
C515	ECUV1C104KBV	0.1	
C516	PQCUV1C105ZF	1	
C517	ECUV1C104ZFV	0.1	
C518	ECUV1A105ZFV	1	
C519	ECUV1A105ZFV	1	
C520	ECUV1A105ZFV	1	
C521	ECUV1C104KBV	0.1	
C522	ECUV1A105ZFV	1	
C523	ECUV1C104ZFV	0.1	
C524	ECST0JY106	10	
C525	ECST0JY106	10	
C526	ECST0JY106	10	
C527	ECUV1C104KBV	0.1	
C528	ECUV1H103KBV	0.01	S
C600	ECUV1C104ZFV	0.1	
C601	ECUV1C104ZFV	0.1	
C603	ECUV1C104ZFV	0.1	
C604	ECUV1C104ZFV	0.1	
C605	ECUV1C104ZFV	0.1	
C606	ECUV1C104ZFV	0.1	
C607	ECUV1C104ZFV	0.1	
		(OTHERS)	
E1	L5DAAGB00001	LIQUID CRYSTAL DISPLAY	
T1	ETJS13ZA14AB	TRANSFORMER	
X1	PSVCC0025GT	CRYSTAL OSCILLATOR	S

16. FOR THE SCHEMATIC DIAGRAM

Note:

1. **DC voltage measurements are taken with an oscilloscope or a tester with a ground.**
2. **The schematic diagrams and circuit board may be modified at any time with the development of new technology.**



Important safety notice
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of there components, use only manufacturer's specified parts.

17. SCHEMATIC DIAGRAM

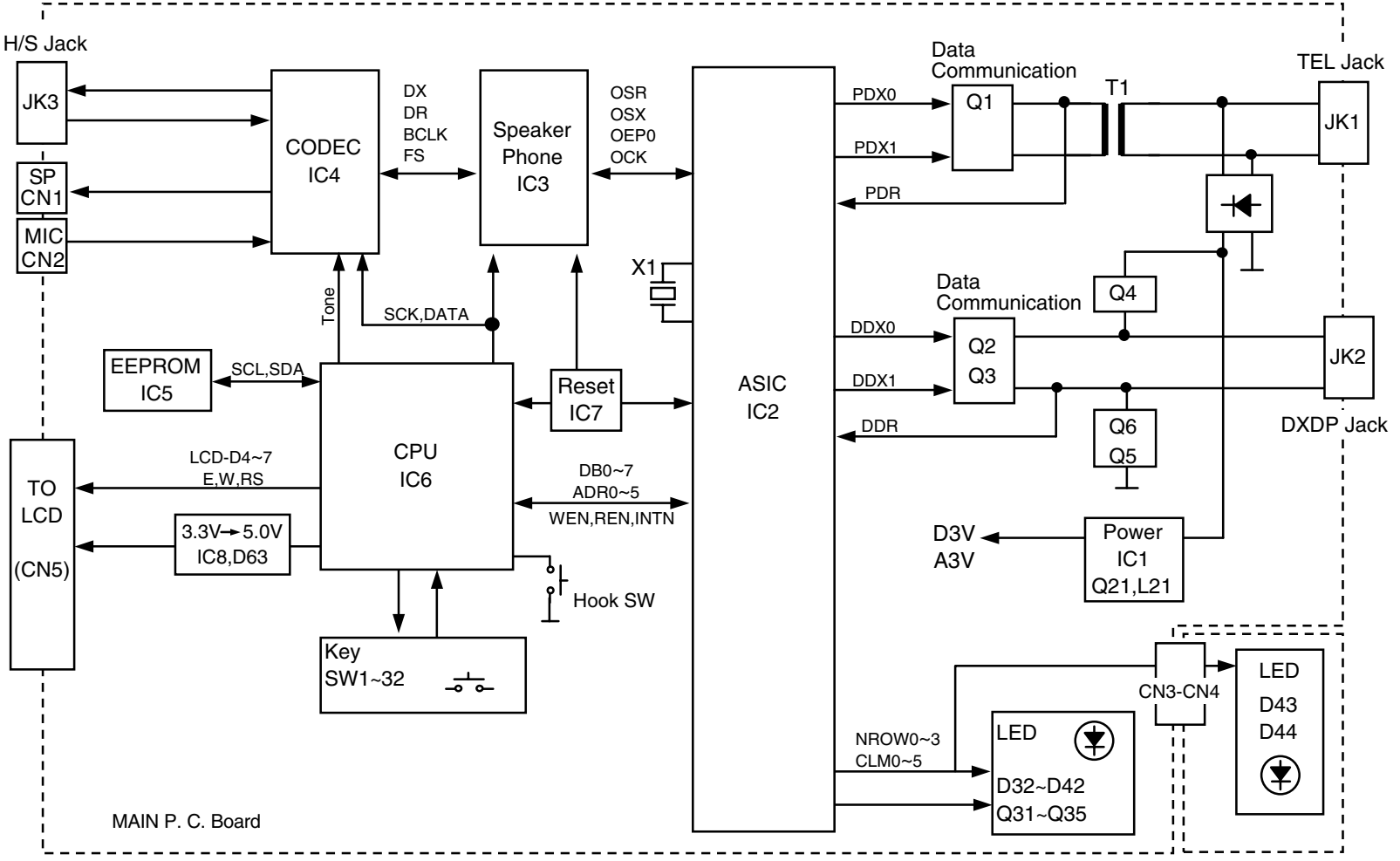
18. WAVEFORM

19. PRINTED CIRCUIT BOARD (MAIN BOARD)

19.1. COMPONENT VIEW

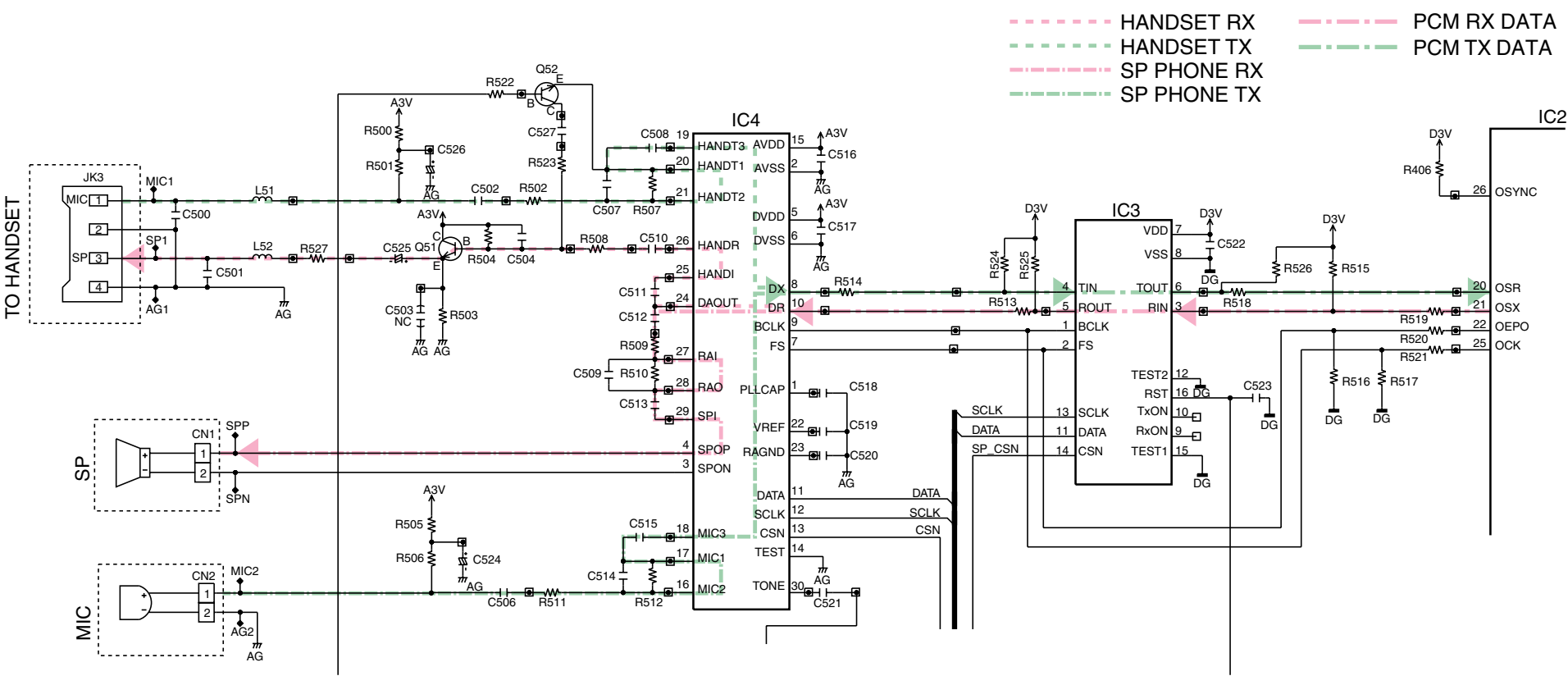
19.2. BOTTOM VIEW

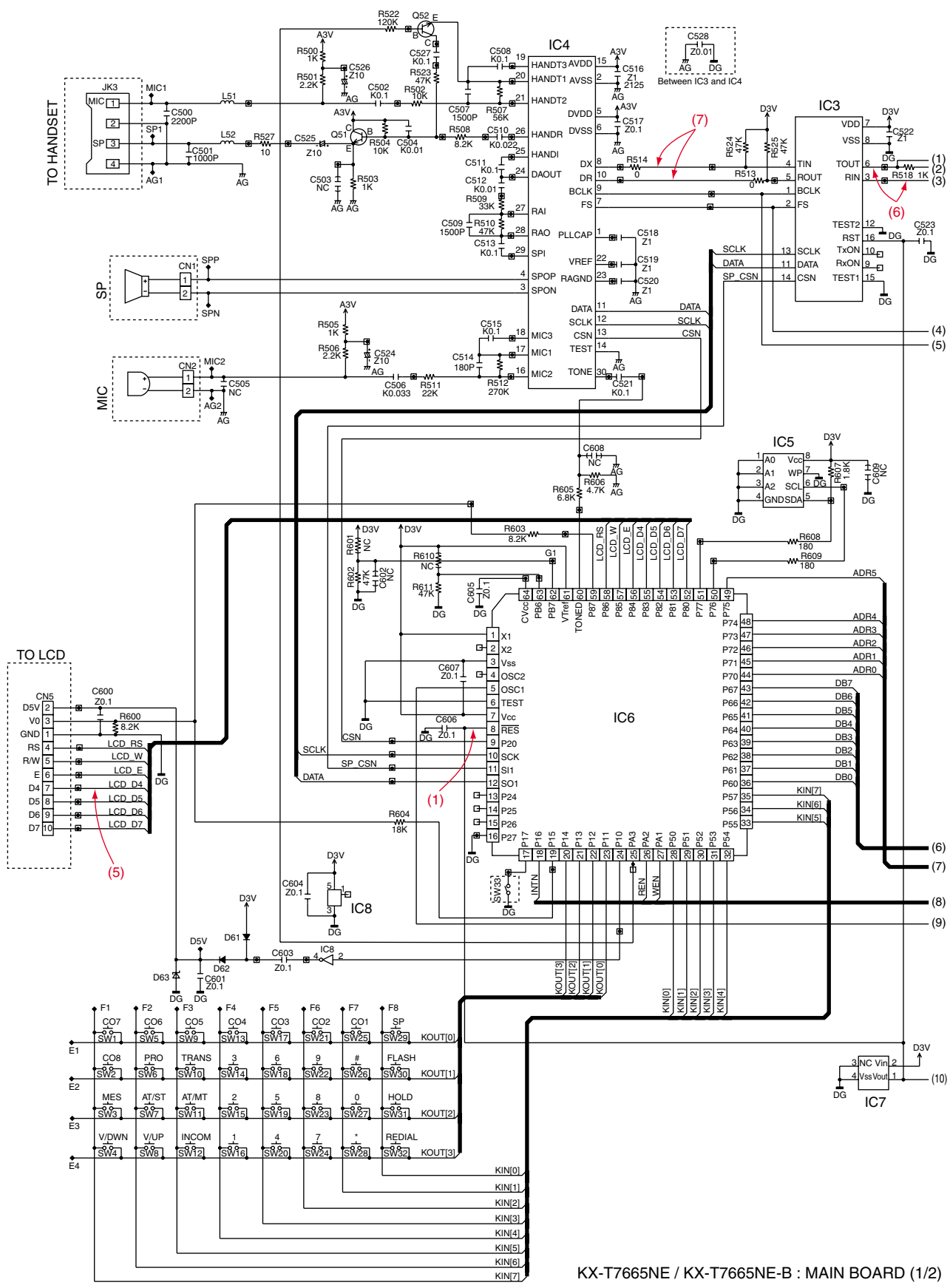
NT1 / KXT7665NE / KXT7665NEB



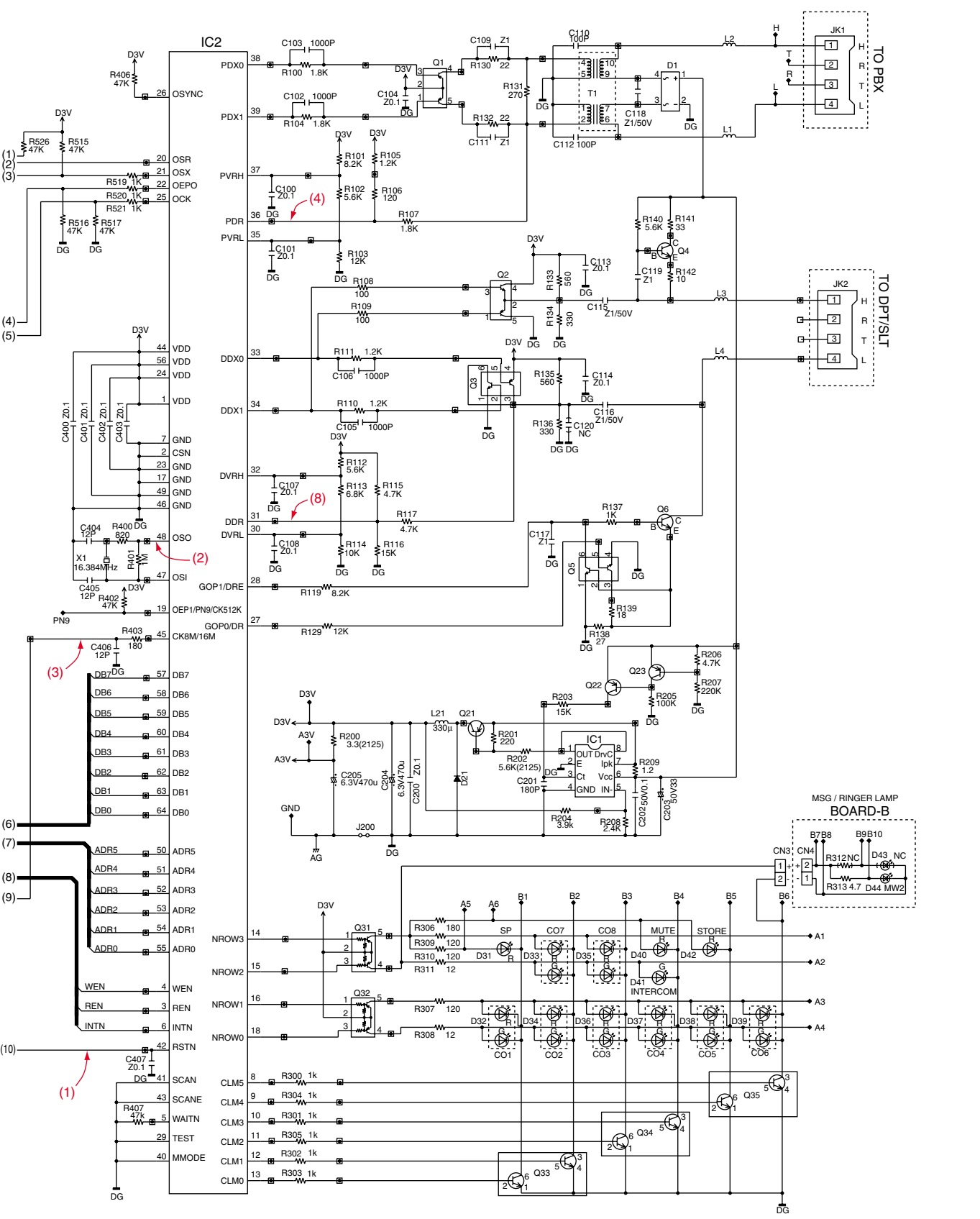
KX-T7665NE / KX-T7665NE-B : BLOCK DIAGRAM

ANALOG CIRCUIT



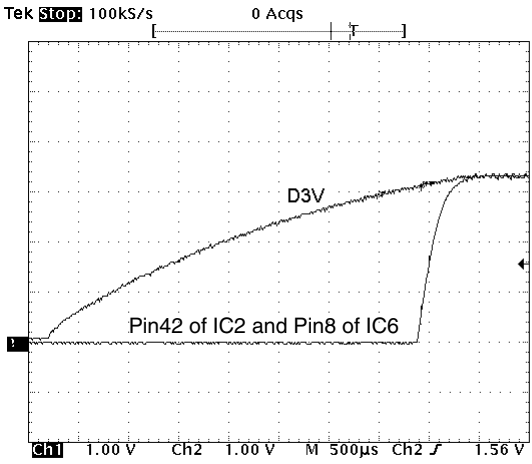


KX-T7665NE / KX-T7665NE-B : MAIN BOARD (1/2)

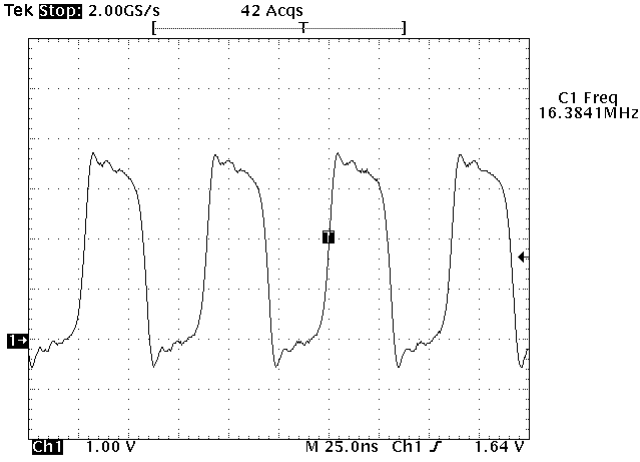


KX-T7665NE / KX-T7665NE-B : MAIN BOARD (2/2)

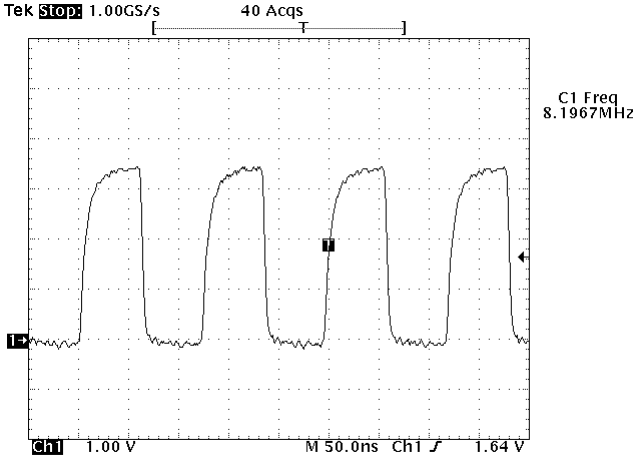
(1) Pin42 of IC2 and Pin8 of IC6
Rest signal



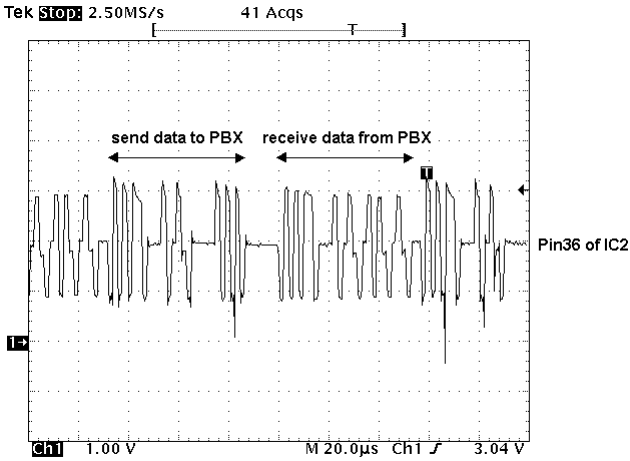
(2) Pin48 of IC2 16.384MHz



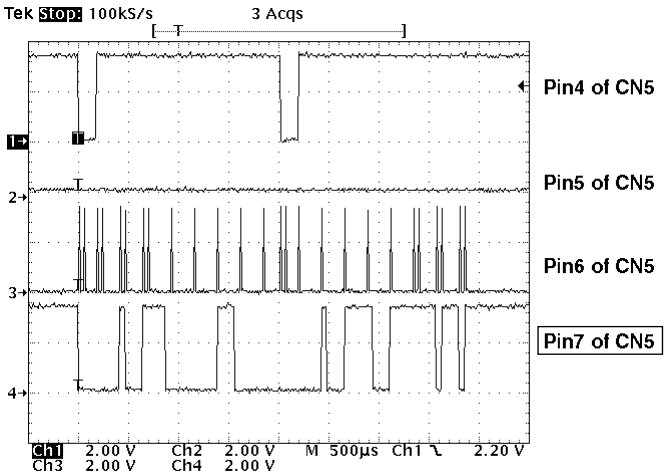
(3) Pin45 of IC2 8.196MHz



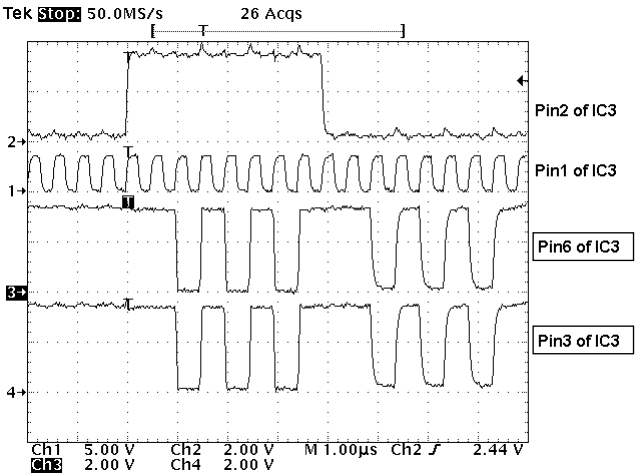
(4) Pin36 of IC2
Communication waveform



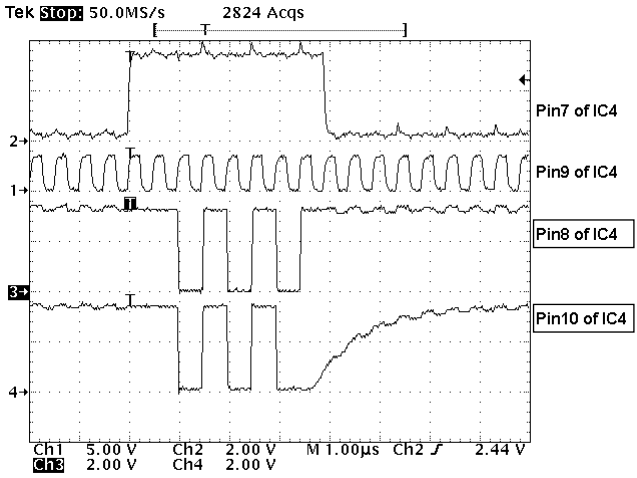
(5) Pin4 to 7 of CN5
Communication waveform



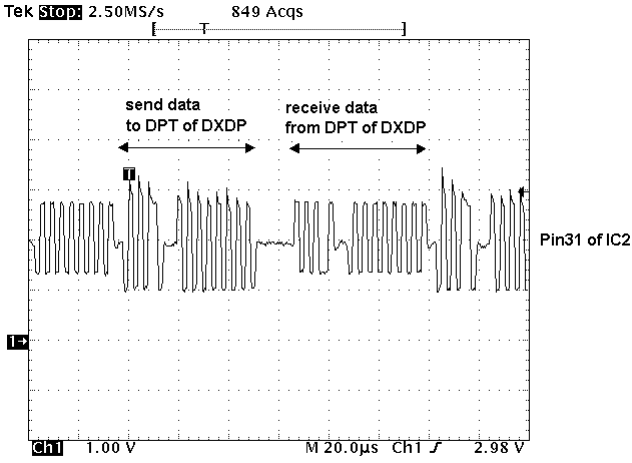
(6) Pin3 and 6 of IC3
PCM interface waveform between IC3 and IC2

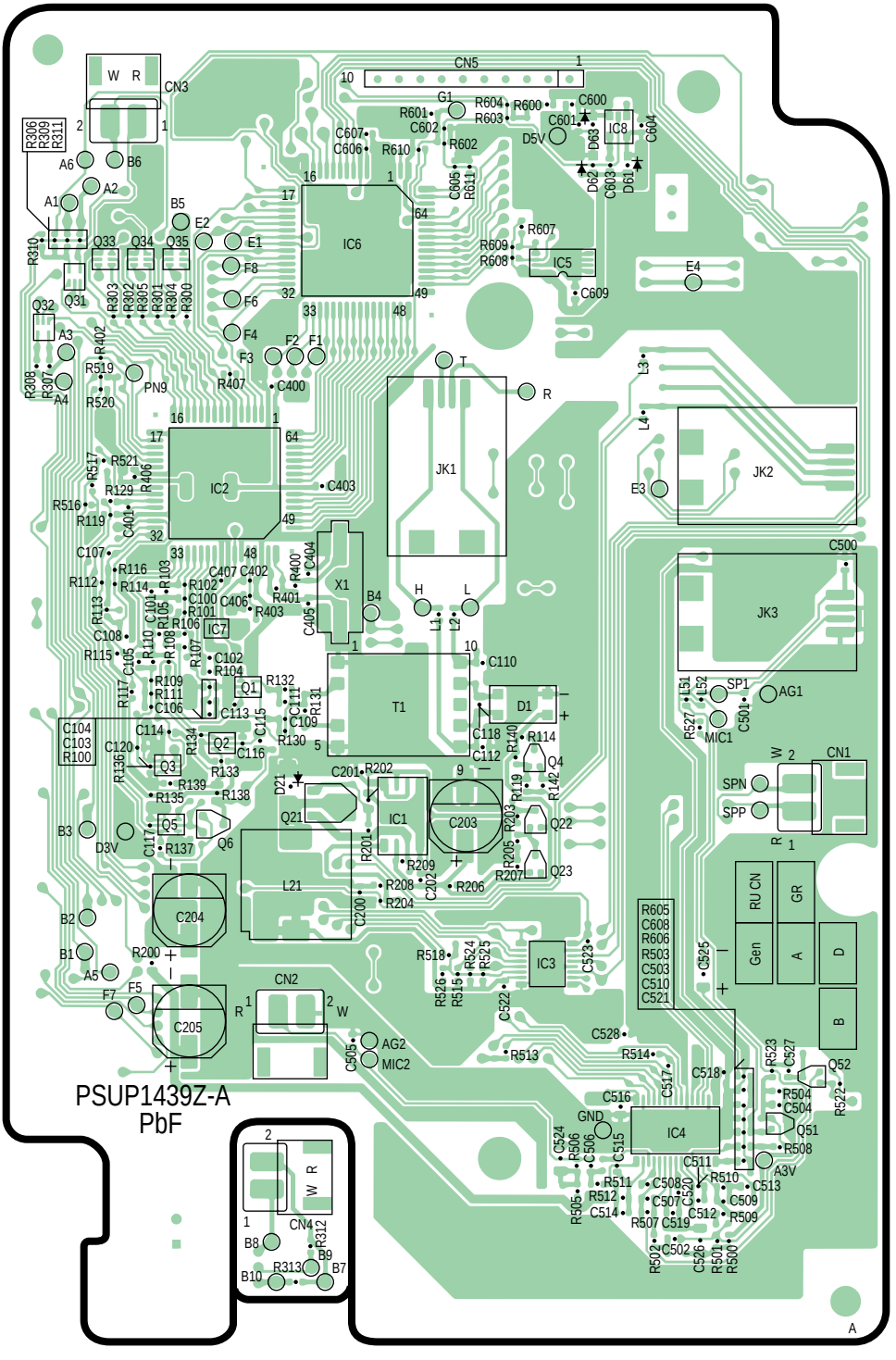


(7) Pin8 and 10 of IC4
PCM interface waveform between IC4 and IC3

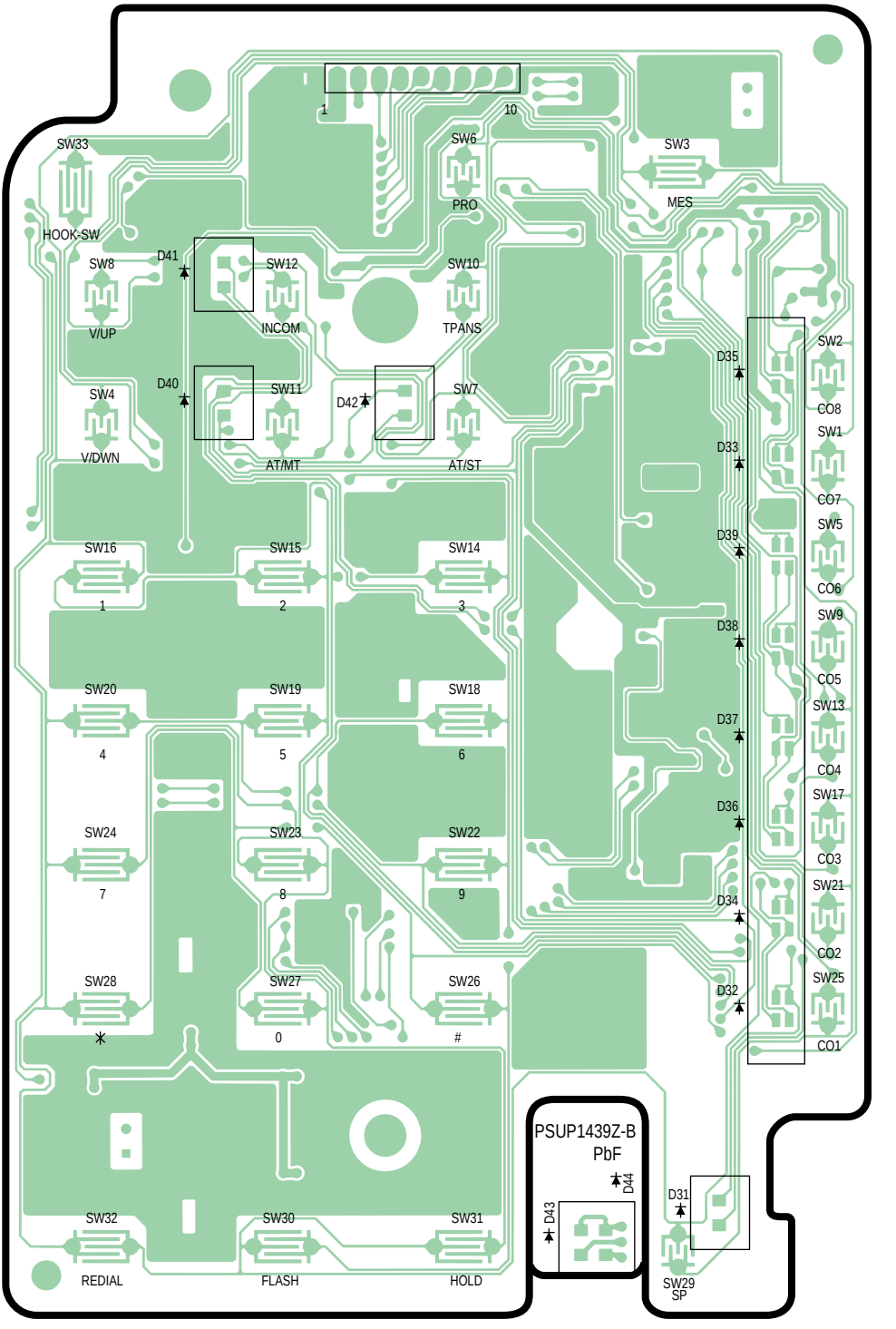


(8) Pin31 of IC2
Communication waveform

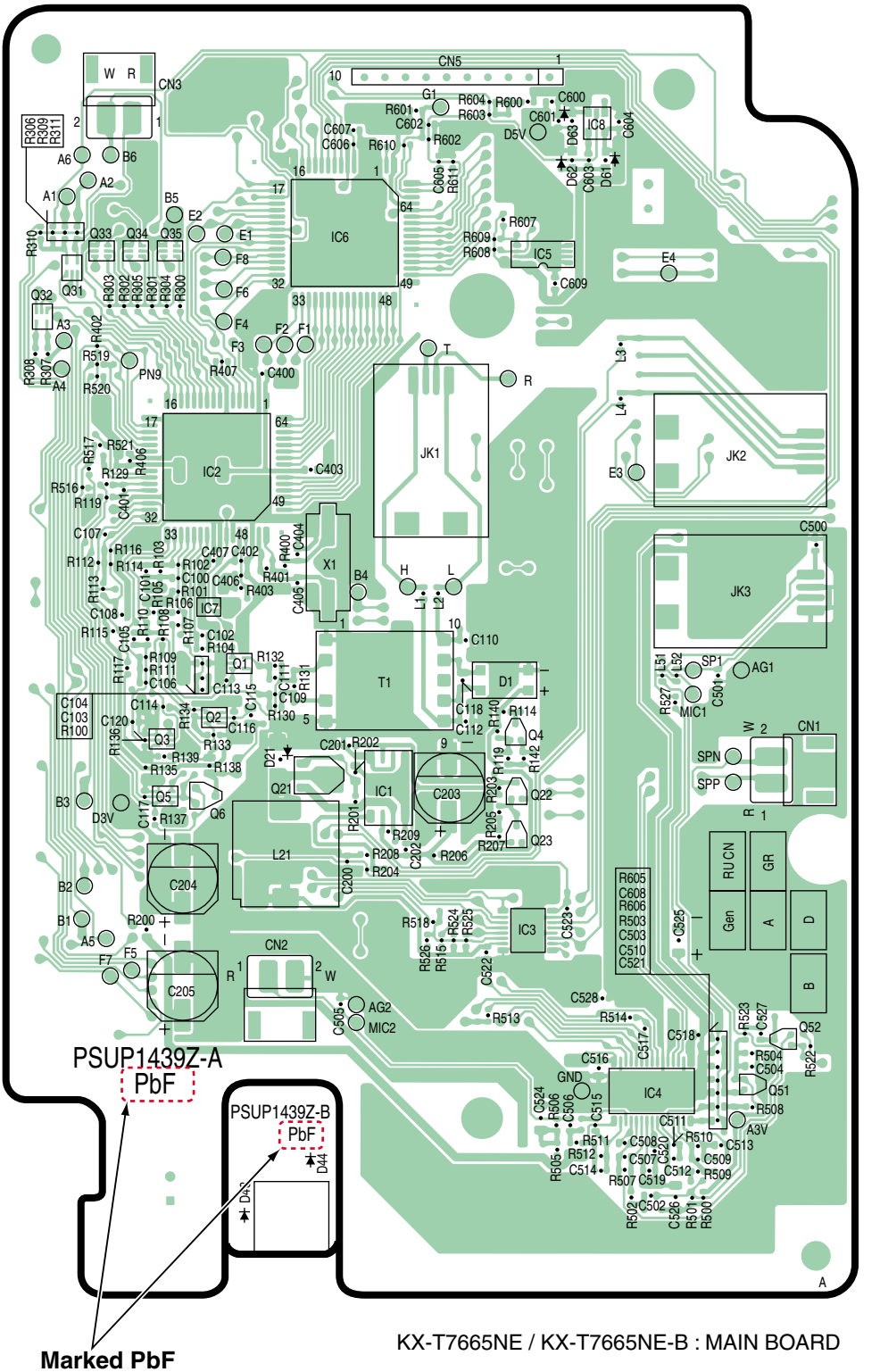




KX-T7665NE / KX-T7665NE-B : MAIN BOARD : COMPONENT VIEW



KX-T7665NE / KX-T7665NE-B : MAIN BOARD : BOTTOM VIEW



KX-T7665NE / KX-T7665NE-B : MAIN BOARD